

# Palm Beach County Fire Rescue



2019  
**PATIENT CARE PROTOCOLS**

6X5FGH78G6H6  
DFJGK354GD  
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FX5H4735H7  
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FCG85H73  
XFG5H73  
FX57H3XEH  
XFG46H75X  
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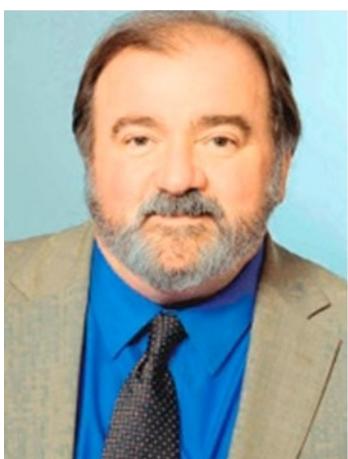
- The following Emergency Medical Services Protocols are the Official Advanced and Basic Life Support Protocols for Palm Beach County Fire Rescue and are approved for such use by Paramedics and EMTs of the department to care for the sick and injured. Only those Paramedics and EMTs approved by the Medical Director shall be authorized to utilize these protocols.



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# ***STANDING ORDERS***

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***General Information (p. 13)***

***Patient Assessment (p. 15)***

***Basic Life Support (p. 17)***

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***Adult Transport Destinations (p. 19)***

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# General Information



## INFORMATION

It is recognized that the EMS protocols cannot address every possible scenario. Therefore, EMS Captains and Trauma Hawk personnel are given the authority to deviate from the ALS protocols as needed. Clear documentation of the deviation is required. Good judgment and the patient's best interest must be considered at all times.



## ADULT & PEDIATRIC



### MEDICATION ADMINISTRATION

- Prior to administering any medication, inquire about medication allergies or adverse reactions to medications
- Follow the 6 Rights of drug administration:
  - Person      • Time
  - Drug          • Route
  - Dose         • Documentation
- A true allergy to a medication causes a rash, SOB, swelling of the tongue, face and/or throat
- The administering paramedic shall use closed-loop communication with a second paramedic to ensure proper drug, dose and any contraindications prior to administration.

### INTRAOSSEOUS SITES (EZ-IO)

- An IO should be placed for patients with emergency medical conditions that require urgent vascular access in whom an IV is not immediately obtainable or is deemed to have insufficient access
- Adult:
  - Proximal Humerus
  - Proximal Tibia
  - Distal Tibia
- Pediatric:
  - Distal Femur
  - Proximal Tibia
  - Distal Tibia
  - Proximal Humerus (only if the surgical neck can be palpated)

### IM INJECTIONS

- All IM injections shall be administered in the lateral thigh
- Adults:
  - 21-23 gauge 1.5 inch needle
  - 4mL maximum per site
- Pediatric:
  - 23 gauge 1 inch needle
  - 1mL maximum per site
    - If > 1mL needs to be administered, split the dose between both thighs

### MUCOSAL ATOMIZATION DEVICE (MAD)

- The following medications can be administered via the MAD:
  - Versed      • Fentanyl
  - Narcan      • Ketamine
- Desired dose:
  - 0.3mL - 0.5mL per nostril
  - Max 1mL per nostril

# **General Information** *continued....*



## **ADULT & PEDIATRIC**



### **MEDICATION DILUTION INSTRUCTIONS**

- **PUSH-DOSE PRESSOR EPINEPHRINE (1:100,000):**
  - **Dilute:** Discard 9 mL of Epi 1:10,000 (0.1mg/mL) and draw up 9 mL of **NORMAL SALINE** to create Push-Dose Pressor Epi 1:100,000. This will yield 10mcg/mL.
- **BENADRYL:**
  - **Dilute** with 9mL **NORMAL SALINE** for IV/IO administration
- **KETAMINE:**
  - Ensure **KETAMINE** is **diluted** per specific protocol



### **PEDIATRIC**

- Patients who have not reached puberty are considered pediatric patients and shall be treated under the pediatric guideline section of these protocols
- Patients who have reached puberty shall be treated as an adult
- IO is the preferred method of vascular access during pediatric cardiac arrest

### **THE "HANDTEVY" SYSTEM**

- The "Handtevy" system shall be utilized in the resuscitation and treatment of all pediatric patients
- The child's age should be used as the primary reference point for determining the appropriate patient care
- If the child appears shorter or taller than stated age or if the age is unknown use the "Handtevy" system length based tape
- Refer to the "Handtevy" system for the following:
  - Medication Dosages/Infusions
  - Equipment
  - Electrical Therapy
  - Vital Signs

### **PEDIATRIC AGE CLASSIFICATIONS**

- **Neonates:**
  - Birth to 1 month
- **Infants:**
  - 1 month to 1 year
- **Children:**
  - 1 year to puberty

#### **PUBERTY**

- **Female puberty is defined as breast development**
- **Male puberty is defined as underarm, chest or facial hair**
- **Once a child reaches puberty, use the adult guidelines for treatment**

# Patient Assessment



ADULT & PEDIATRIC



## MENTAL STATUS (AVPU)

- **Alert:** to person, place, time, and event (AAOX4)
- **Verbal:** responds only to verbal stimuli
- **Pain:** responds only to painful stimuli
- **Unresponsive**

## VITAL SIGNS

- Pulse (rate, rhythm and quality)
- Respirations (rate and quality)
- Temperature
- Pulse Oximetry
- Blood Pressure (capillary refill)
- EtCO<sub>2</sub>
- BGL
- Priority 3 patients shall receive at least 2 sets of vitals
- Priority 2 patients shall receive vitals every 5 minutes
- A manual Blood Pressure shall be taken to confirm any abnormal or significant changes of an automatic Blood Pressure cuff reading
- Blood Pressure shall be checked before and after administration of a drug
- Hypotension for adults is defined as Systolic BP < 90 mm Hg

## ETCO<sub>2</sub> MONITORING

- Shall be utilized for the following patients:
  - Patients requiring ventilatory support (e.g., BVM, ET tube, SGA, CPAP)
  - Patients in respiratory distress
  - Patients with Altered Mental Status
  - Patients who have been sedated
  - Patients who have received pain medication
  - Seizure patients

## GLUCOSE

- A BGL shall be documented for patients with any of the following:
  - History of diabetes
  - Altered mental status
  - General weakness
  - Seizure
  - Syncope/lightheadedness
  - Dizziness
  - Poisoning
  - Stroke
  - Cardiac arrest

**Patient with Altered Mental Status consider:  
AEIOU-TIPS**

- **A**lcohol
- **E**pilepsy (Seizures)
- **I**n insulin (Hyper-/Hypoglycemia)
- **O**verdose/Oxygenation
- **U**remia (Kidney Failure)
- **T**rauma
- **I**nfection (Sepsis)
- **P**sychiatric
- **S**troke/Shock

# Patient Assessment *continued....*



## ADULT & PEDIATRIC



### ECG MONITORING

- All ALS patients shall be continuously monitored in lead II
- 12 and 15 lead ECGs shall be performed on the following patients:
  - Chest/arm/neck/jaw/upper back/shoulder/epigastric pain or discomfort
  - Palpitations
  - Syncope, lightheadedness, general weakness, or fatigue
  - CHF, SOB, hypertension or hypotension
  - Unexplained diaphoresis or nausea
- 12 and 15 lead ECGs shall be repeated every 10 minutes and upon ROSC
  - When transporting, leave cables connected until patient is turned over to the Emergency Department (ED) staff

### PATIENT HISTORY

- CHIEF COMPLAINT: Why did the person call 911?
- S.A.M.P.L.E. HISTORY (**S.A.M.P.L.E.**)
  - **SIGNS & SYMPTOMS**
  - **ALLERGIES**
  - **MEDICATIONS:** Prescribed, over the counter, or not prescribed to patient
  - **PAST MEDICAL HISTORY (patient's and immediate family's)**
  - **LAST ORAL INTAKE**
  - **EVENTS PRECEDING**
- HISTORY OF THE PRESENT ILLNESS (**O.P.Q.R.S.T.A**)
  - **ONSET:** Did the symptoms appear gradually or suddenly?
  - **PALLIATIVE:** What makes the symptoms better?
  - **PROVOKE:** What makes the symptoms worse?
  - **PREVIOUS:** Previous similar episodes?
  - **QUALITY:** (What kind of pain?) pressure, squeezing, aching, dull, etc.
  - **RADIATION:** Does the pain or discomfort radiate? Where?
  - **SEVERITY OF PAIN:** 1-10 scale (utilize "Faces" pain scale for pediatrics)
  - **TIME:** What time did the symptoms begin?
  - **ASSOCIATED:** What are the associated signs & symptoms?

# Basic Life Support



## ADULT & PEDIATRIC



### AIRWAY

- **AIRWAY POSITIONING:**

- Medical patient:
  - Position patient with external auditory meatus (a.k.a. "The Earhole") on the same external plane as the sternal notch
- Trauma patient with suspected spinal cord injury:
  - Modified jaw thrust
- **NASOPHARYNGEAL AIRWAY (NPA):**
  - Semi-conscious patients with an intact gag reflex shall have a nasopharyngeal airway inserted, unless contraindicated
- **OROPHARYNGEAL AIRWAY (OPA):**
  - Unresponsive patients without a gag reflex shall have an oropharyngeal airway inserted, unless contraindicated

### OXYGEN ADMINISTRATION

- **DO NOT** withhold Oxygen if the patient is dyspneic or hypoxic

- **SpO<sub>2</sub>:**

- Maintain SpO<sub>2</sub> of 95% for:
  - All patients
    - **Exception:** COPD & Asthma
- Maintain SpO<sub>2</sub> of 90% for:
  - COPD & Asthma

- **OXYGEN ADMINISTRATION:**

- 2 LPM NC
  - All Stroke patients (increase oxygen therapy as needed)
- 15 LPM via NRB regardless of SpO<sub>2</sub>
  - All 3rd trimester pregnancy trauma patients
  - All head injury patients
  - Decompression sickness
  - Carbon Monoxide exposure
  - Cyanide exposure

- If oxygen saturation cannot be maintained, ventilatory support should be provided

### CIRCULATION

- Adult:

- Carotid and radial pulse present, assess capillary refill, assess skin color, condition and temperature
- Refer to the "Cardiac Arrest" algorithm (pg. 70), for all patients found pulseless

- Pediatric:

- Carotid and radial pulse present (brachial in infants), assess capillary refill, assess skin color, condition and temperature
- Refer to the "Cardiac Arrest" algorithm (pg. 73), for all patients found pulseless
- Refer to the "Bradycardia" protocol (pg. 50), for pediatric patients found bradycardic with signs of poor perfusion and AMS

# Ventilatory Assistance



## INFORMATION

- In certain patients, excessive ventilation rates may be harmful.
- Overzealous positive pressure ventilation can impair:
  - Venous return
  - Cardiac output
  - Cerebral perfusion
- Ultimately the patient's SpO<sub>2</sub> and EtCO<sub>2</sub> should determine the ventilation rate for the patient (ideally EtCO<sub>2</sub> should be 35-45 mm Hg).



## ADULT

### VENTILATORY RATES

- **PATIENTS WITH A PULSE:**
  - 1 breath every 6 seconds
- **PATIENTS WITHOUT A PULSE:**
  - 1 breath every 10 seconds. Coordinate compressions and ventilations to avoid simultaneous delivery.
- **PATIENTS WITH ICP and/or HERNIATION:**
  - Maintain EtCO<sub>2</sub> between **30-35** mm Hg and SpO<sub>2</sub> > 90% while continuously monitoring BP



## PEDIATRIC

### VENTILATORY RATES

- **PATIENTS WITH A PULSE:**
  - 1 breath every 3 seconds
- **PATIENTS WITHOUT A PULSE:**
  - 1 breath every 6 seconds. Coordinate compressions and ventilations to avoid simultaneous delivery.
- **PATIENTS WITH ICP and/or HERNIATION:**
  - Maintain EtCO<sub>2</sub> between **30-35** mm Hg and SpO<sub>2</sub> > 90% while continuously monitoring BP

The preferred method for ventilating pediatric patients is with a BVM in conjunction with an oral or nasal airway. Pediatric patients who can not protect their airway, are unable to maintain oxygen saturation despite BVM ventilation, and/or can not be effectively ventilated with a BVM, should be upgraded to a Supraglottic Airway (SGA) (age specific) followed by intubation if needed.

### **WARNING**

#### **DO NOT ATTEMPT TO AGGRESSIVELY NORMALIZE CAPNOMETRY/EtCO<sub>2</sub> READINGS IN THE FOLLOWING PATIENTS:**

- Cardiac arrest pre/post ROSC
- Bronchospasm (i.e., asthma, COPD)
- High EtCO<sub>2</sub> levels are acceptable and even desired in these patients

# Adult Transport Destinations



## INFORMATION

### Priority 1:

- Patients in **Cardiac or Respiratory Arrest**

### Priority 2:

- Unstable patients **with** immediate life-threatening conditions

### Priority 3:

- Stable patients **with no** immediate life-threatening conditions

**It is expected that the Lieutenant will be in the patient care compartment during transport for all priority 1 and 2 patients. The Lieutenant may use discretion with priority 3 transports, but shall be in the patient care compartment for the majority of the transports.**

## **WARNING**

Placing patients in the prone position is contraindicated due to the risks of asphyxiation. However, impalement or other situations may mandate the prone position. In these instances, clear documentation of justification and attention to airway maintenance is mandatory.



## ADULT

### PRIORITY 1 PATIENTS

- **PRIMARY CARDIAC ARREST:**
  - If transport time is **< 20 minutes:**
    - Transport to the closest STEMI facility
  - If transport time is **> 20 minutes:**
    - Transport to the closest ED (excluding free standing ED)
- **RESPIRATORY ARREST/SECONDARY ARREST:**
  - Transport to the closest ED (excluding free standing ED)

### PRIORITY 2 PATIENTS

- Shall be transported to the closest appropriate ED
- **TRAUMA ALERT:**
  - Shall be transported to the closest Trauma Center. If on bypass, transport patient to the next closest Trauma Center
  - A minimum of 1 paramedic and 1 EMT must accompany a trauma alert patient in the back of the rescue, provided it does not cause a significant delay in transport
  - On-scene times for Trauma Alert patients should be **< 10 minutes**. On-scene times **> 10 minutes** shall have the reason for the delay documented in the ePCR report.
  - If ground transport is **> 25 minutes** transport by air
  - Trauma patients who arrest in the presence of Fire Rescue personnel, shall be transported to the closest Trauma Center
- **PREGNANT TRAUMA ALERTS (visibly or by history of gestation > 20 weeks):**
  - Pregnant patients meeting Trauma Alert criteria should be transported to St. Mary's Trauma Center by air whenever possible
- **TRAUMA ARREST:**
  - If Trauma Hawk is not available and ground transport is greater than 40 minutes, it is acceptable to transport to the nearest ED

# **Adult Transport Destinations** *continued....*



## **PRIORITY 2 PATIENTS CONTINUED**

### **• STEMI ALERTS:**

- Shall be transported to the closest STEMI facility
- If ground transport is > 40 minutes transport by air to the closest STEMI facility with surgical backup
- Patient presentations that are indicative of myocardial ischemia that **DO NOT** meet "STEMI Alert Criteria" should still be transported to a STEMI facility

### **• STROKE ALERTS:**

- All Stroke Alerts shall be transported to a Comprehensive Stroke Center
  - **Exception:** Known terminal illness or Hospice Care patients can still be treated as a **STROKE ALERT**. Transport these patients to the closest Stroke Center (Primary **OR** Comprehensive).
- If ground transport is > 40 minutes transport by air to the closest Comprehensive Stroke Center

### **• SEPSIS ALERT:**

- All Sepsis Alerts shall be transported to closest ED (excluding free standing ED)

### **• ST. MARY'S HYPERBARIC CHAMBER (encode prior to transport to confirm availability):**

- Decompression Sickness
  - If ground transport is > 40 minutes transport by air
- Carbon Monoxide Exposure
- Hydrogen Sulfide Exposure
- Cyanide Exposure

### **• INTUBATED INTERFACILITY TRANSFERS:**

- Should be both paralyzed and sedated by the sending facility
  - If the sending facility physician refuses to administer paralytics, the EMS Captain must:
    - Be contacted
    - Follow the Advanced Airway protocol
    - Accompany the patient to the receiving facility

## **PRIORITY 3 PATIENTS**

- Should be transported to the closest appropriate ED of their choice within 40 minutes. The EMS Captain may approve/decline transport requests longer than 40 minutes.
- **FREE STANDING ED:**
  - Stable patients may be transported to a "Free Standing ED" after:
    - Being informed if they need to be admitted, they will be transferred to another facility
    - Signing an Emergency Transport Disclaimer
- **OBSTETRICAL:**
  - Obstetrical (OB) patients are defined as gestation > 20 weeks
  - Unstable OB patients should be transported to the closest OB ED
  - Stable OB patients should be transported to the OB ED of their choice within 40 minutes
- **BAKER ACT:**
  - Stable Baker Act patients shall be transported to the closest appropriate facility
  - Unstable Baker Act patients shall be transported to the closest ED for stabilization



# Pediatric Transport Destinations



## INFORMATION

- FOR THE PURPOSES OF TRANSPORT, A PEDIATRIC PATIENT IS CONSIDERED < 18 YEARS OLD

### PRIMARY PEDIATRIC EMERGENCY DEPARTMENT

- These hospitals **DO NOT** have inpatient pediatric capabilities but are comfortable treating minor pediatric illnesses and injuries in their ED.



### COMPREHENSIVE PEDIATRIC EMERGENCY DEPARTMENT

- These hospitals have pediatric admitting capabilities and surgery options. They can also provide a bridge to pediatric intensive care.

## PEDIATRIC

### PRIORITY 1 PATIENTS

#### TRANSPORT TO COMPREHENSIVE PEDIATRIC ED:

- Pediatric patients who have regained a ROSC
- Pediatric respiratory arrest cases that have successful airway management (i.e., good compliance with the BVM and airway adjuncts, positive EtCO<sub>2</sub> waveform, improving pulse oximetry)

#### TRANSPORT TO CLOSEST APPROVED PEDIATRIC ED PRIMARY OR COMPREHENSIVE:

- Pulseless pediatric patients
- Pediatric respiratory arrest patients who have an unstable airway (i.e., unable to ventilate or oxygenate)

### PRIORITY 2 PATIENTS

#### TRAUMA ALERT PATIENTS:

- Shall be transported to the closest Trauma Center. If on bypass, transport patient to the next closest Trauma Center
- A minimum of 1 paramedic and 1 EMT must accompany a trauma alert patient in the back of the rescue, provided it does not cause a significant delay in transport
- On-scene times for Trauma Alert patients should be < 10 minutes. On-scene times > 10 minutes shall have the reason for the delay documented in the ePCR report.
- If ground transport is > 25 minutes transport by air
- Trauma patients who arrest in the presence of Fire Rescue personnel, shall be transported to the closest Trauma Center

#### TRAUMA ARREST:

- If Trauma Hawk is not available and ground transport is greater than 40 minutes, it is acceptable to transport to the nearest ED

#### STROKE ALERTS:

- All Stroke Alerts shall be transported to St Mary's
- If ground transport is > 40 minutes transport by air to St. Mary's

#### SUSPECTED SEPSIS:

- Shall be transported to closest Comprehensive Pediatric ED

#### ST. MARY'S HYPERBARIC CHAMBER (ENCODE PRIOR TO TRANSPORT TO CONFIRM AVAILABILITY):

- Decompression Sickness
  - If ground transport is > 40 minutes transport by air
- Carbon Monoxide Exposure
- Hydrogen Sulfide Exposure
- Cyanide Exposure

### PRIORITY 3 PATIENTS

- Should be transported to the closest appropriate pediatric ED.

# ***Helicopter Transport Criteria***



**ADULT & PEDIATRIC**



## **HELICOPTER OPERATIONAL CRITERIA FOR TRAUMA PATIENTS:**

- Pre-hospital ground transport to a Trauma Center is > 25 minutes
- Pre-hospital scene extrication time > 15 minutes
- Pre-hospital ground response time to the scene is > 10 minutes
- Mass Casualty Incidents (MCI) involving multiple patients with traumatic injuries

## **HELICOPTER MAY BE USED:**

- For patients weighing 350lbs-500lbs, discretion should be used as to whether air transport is the preferred method of transport
- The flight crew must be capable of loading, unloading, and treating the patient within the confines of the aircraft
- The flight crew has final authority to accept or reject the transport

## **HELICOPTER SHALL NOT BE USED:**

- Bariatric patient known or estimated to be five-hundred pounds (500lbs) (227kg) or greater
- Patient who is unable to lay supine (when clinically indicated for air transport)
- Patient who is combative and cannot be physically and/or chemically restrained
- Hazmat contaminated patient

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# ***BASIC LIFE SUPPORT***

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***BLS Medical Emergencies (p. 25)***

***BLS Trauma Emergencies (p. 26)***

***BLS Bites & Stings (p. 29)***

# BLS Medical Emergencies



## ADULT & PEDIATRIC



### ALLERGIC REACTION

- Allergic reactions are characterized by any of the following:
  - Generalized urticaria
  - Airway, tongue, or facial swelling, respiratory distress, bronchospasm, nausea, vomiting, or diarrhea
  - Loss of radial pulse or SBP of < 90 mm Hg
- Determine the source of the allergic reaction (insect, food, medications, etc.)
- If patient presents with airway swelling/respiratory distress/bronchospasm/tongue and/or facial swelling/loss of a radial pulse or SBP of < 90 mm Hg:
  - Assist patient with prescribed Epi-Pen

### CARDIAC ARREST

- Refer to the "Cardiac Arrest" algorithm (pg. 70), for all patients found pulseless

### OVERDOSE/POISONING

- Try to identify source of the overdose/poisoning
- Assist patient with **NARCAN** if available/applicable
- Consider contacting the **Florida Poison Control Center** at **1-800-222-1222**

### SEIZURES

- Consider the possible causes:
  - Meningitis
  - Fever
  - Head trauma
  - Hemorrhagic stroke
  - Drugs
  - Alcohol
  - Diabetic
  - Poisoning
- Protect patient from injury if actively seizing

### ALTERED MENTAL STATUS

- Check and record BGL
- If BGL is < 60 mg/dL, and patient is able to protect their airway/swallow:
  - **ORAL GLUCOSE:**
    - 15g, if able to swallow and follow commands
    - May repeat 1x prn
    - **Contraindications:**
      - Patients who are not conscious enough to swallow
      - Patients < 2 years old

# BLS Trauma Emergencies



ADULT & PEDIATRIC



## EXPOSE

- As a general rule, only remove as much of the clothing as necessary to determine the presence or absence of an injury. Cover the patient as soon as possible to keep the patient warm.

## SPINAL MOTION RESTRICTION

- Perform manual Spinal Motion Restriction by providing manual cervical stabilization and apply an appropriately sized cervical collar as appropriate if the patient meets any of the following criteria:
  - Complaint or finding of focal neurologic deficit on motor or sensory exam
  - Complaint or finding of pain to the neck or back
  - Presence of a distracting injury
  - Altered level of consciousness with an MOI (Mechanism of Injury)
  - Intoxication with an MOI present
- The key objective is to move the patient in the safest, most anatomically neutral position possible
- If an appropriately sized collar is not available or if the collar compels the patient to move, remove the collar and provide Spinal Motion Restriction
  - Place rolled towels on the sides of the patient's head and neck
  - Secure with tape or other similar devices to allow for comfortable cervical stabilization/immobilization
  - The cervical collar should not cause the patient discomfort such that they are compelled to move
- Place the patient on the stretcher cushion, supine
- If the patient is unable to tolerate this position, place in a position of comfort, that also respects normal anatomical alignment

## HELMET REMOVAL

- Helmets should be removed from all patients
- If applicable, protective pads should also be removed
- Athletic trainers should be consulted in the helmet/protective pad removal process if applicable
- Spinal motion restriction should be "manually" performed during the removal process

## BURNS

- Refer to the "Burn Injuries" protocol (pg. 108)

## EYE EMERGENCIES

- CHEMICAL EXPOSURES:**
  - Remove contact lens if present
  - Irrigate the affected eye(s) with **NORMAL SALINE**
  - Be careful not to contaminate the unaffected eye with runoff
- PENETRATING EYE INJURIES:**
  - Stabilize any penetrating object
  - Cover both eyes with gauze and an eye shield
  - Keep the patient calm, as crying, screaming or coughing can force more of the tissue outward
  - DO NOT** attempt to replace or move the protruding tissue



## CLOSED FRACTURES

- Fractures should be splinted in the position found
  - **Exception:** No pulse present **OR** the patient cannot be transported due to the extremity's unusual position
    - 2 attempts can be made to place the injured extremity in a normal anatomical position
    - Discontinue attempts if:
      - The patient complains of severe pain
      - **OR**
      - If there is resistance to movement felt
    - Reassess neurovascular status before and after repositioning of patient's extremity
- **CLOSED MID-SHAFT FEMUR FRACTURES**
  - Apply a Sager Traction Splint
    - **Contraindications:**
      - There is also a suspected pelvic fracture
      - There is an open femur fracture
      - There is also a suspected hip fracture
      - There is an avulsion/amputation of the ankle or foot
      - Suspected fracture distal to mid shaft femur
    - Reassess neurovascular status before and after repositioning of patient's extremity

## OPEN FRACTURES

Refer to the "Open Fracture" protocol (pg. 112)

## HIP FRACTURES & HIP DISLOCATIONS

- Consider hip fractures in an elderly patient who fell and complains of pain in the knee, hip or pelvis
- A scoop stretcher should be used whenever possible to move patients with a suspected hip fracture
- Splint in position of comfort with pillows and blankets
- Reassess neurovascular status before and after moving the patient
- Sager Traction splints shall **NOT** be used on suspected hip fractures or hip dislocations
- **POSTERIOR HIP DISLOCATIONS:**
  - Most often present with the leg flexed and internally rotated, and will not tolerate having the extremity straightened
- **ANTERIOR HIP DISLOCATIONS:**
  - Present with external rotation and shortening of the affected leg

## PELVIC FRACTURE

- Assess and treat for shock
- **DO NOT** perform a pelvic rock. Assess the pelvis by applying gentle pressure anterior to posterior and from the sides to identify crepitus or instability. **DO NOT** repeat.
- Stabilize if possible
- A scoop stretcher should be used whenever possible to move patients with suspected pelvic fracture
- Splint in position of comfort with pillow and blankets
- Reassess neurovascular status before and after moving the patient

# BLS Trauma Emergencies *continued....*



## BLEEDING CONTROL

### EXTREMITY INJURIES:

- Direct pressure (utilizing manual pressure and pressure dressings)
- Combat Application Tourniquet (C.A.T.)
  - Apply high and tight on a single long bone until the bleeding stops
  - **DO NOT** apply C.A.T. directly over injury site or joint.
  - If bleeding persists after initial C.A.T, apply a second C.A.T.
- Celox Rapid (If 2<sup>nd</sup> C.A.T application fails to control bleeding):
  - Pack wound with Celox Rapid
  - Maintain pressure for a minimum of 1 minute
  - Apply a pressure dressing

### JUNCTIONAL HEMORRHAGE (e.g., neck, axillary, pelvis and groin):

- Celox Rapid
  - Pack wound with Celox Rapid
  - Maintain pressure for a minimum of 1 minute
  - Apply a pressure dressing

## ALL EXTREMITY TRAUMA

- Gross contamination, such as leaves or gravel, should be removed if possible
- Determine mechanism of injury (MOI) and evaluate
- Assess neurovascular status of extremity
  - Color, temperature, capillary refill, crepitus

## AMPUTATION

- Rinse off
- Wrap in sterile gauze and place in a sealed plastic bag
- Place the sealed bag into a second bag with ice packs
- Label the bag with the patient's:
  - Name
  - Date
  - Time of the amputation
  - Time the part was wrapped and cooled

## ABDOMINAL TRAUMA

- **IMPALED OBJECTS:**
  - Impaled objects shall be stabilized to prevent movement and subsequent further damage
  - If bleeding occurs around the impaled object, it should be controlled by holding direct pressure
    - **DO NOT** apply excessive pressure
  - **DO NOT** palpate the abdomen, as it may cause further organ injury from the distal tip of the object
- **EVISCIERATION:**
  - Protect the tissue from further damage
  - Cover the protruding tissue with a moist sterile dressing, then cover with a dry sterile dressing
  - Keep the patient calm, as crying, screaming or coughing can force more of the tissue outward
  - **DO NOT** attempt to replace or move the protruding tissue

# BLS Bites and Stings



## INFORMATION

- Consider contacting the **Florida Poison Control Center** at **1-800-222-1222 OR DAN (Divers Alert Network)** at **(919) 684-4326** as soon as possible for treatment recommendations.



## ADULT & PEDIATRIC



### ALL BITES AND STINGS

- Clean the wound area with soap and water or sterile water
  - Exception:** Marine animal stings
  - DO NOT** use hydrogen peroxide on deep puncture wounds or wounds exposing fat
- Refer to the "Allergic Reaction" protocol (pg. 31), if applicable
- Advise dispatch to contact animal control or the police department if necessary

### SNAKE BITES

- DO NOT** apply ice packs, tourniquets or constrictive bands
- Mark area of edema with a pen
- Remove any constrictive jewelry or clothing
- Splint any extremity that has received a bite and ensure it remains below the heart
- If the **DEAD** snake is on scene, take a picture of the head (including the eyes) with the ePCR device if possible
- For hypotension refer to the "Fluid Resuscitation" protocol (pg. 36)

### INSECT STINGS

- Remove the stinger by scraping the patient's skin with the edge of a flat surface (e.g., a credit card)
  - DO NOT** attempt to pull the stinger out, as this action may release more venom

### MARINE ANIMAL ENVENOMATIONS: STINGRAY, SCORPIONFISH, LIONFISH, ZEBRAFISH, STONEFISH, CATFISH, WEEVERFISH, STARFISH, SEA URCHIN

- Immerse the punctures in non-scalding hot water (if available) to achieve pain relief
- Gently wash the wound with soap and water, and then irrigate it vigorously with sterile water (avoid scrubbing)

### MARINE ANIMAL STINGS: JELLYFISH, MAN-OF-WAR, SEA NETTLE, IRUKANDJI, ANEMONE, HYDROID, FIRE CORAL

- Rinse the skin with sea water (if available)
  - DO NOT** use fresh or sterile water
  - DO NOT** apply ice
  - DO NOT** rub the skin
- Apply white vinegar (if available) topically to involve area until the pain is relieved (lifeguards may carry this)
- Remove large tentacle fragments using forceps with proper PPE on and stay upwind when performing this procedure



# ***ALS Medical Emergencies***

***Allergic Reaction (p. 31)***

***Diabetic Emergencies (p. 33)***

***Dystonic Reaction (p. 35)***

***Fluid Resuscitation/Dehydration (p. 36)***

***Hyperkalemia (p. 37)***

***Nausea/Vomiting (p. 39)***

***Respiratory Distress (p. 40)***

***Seizure (p. 42)***

***Sepsis (p. 44)***

***Stroke (p. 46)***



# Allergic Reaction



## INFORMATION

- Allergic reactions are characterized by any of the following:
  - Generalized urticaria
  - Airway swelling, respiratory distress, bronchospasm, tongue and/or facial swelling, nausea, vomiting, or diarrhea
  - Loss of radial pulse or SBP of < 90 mm Hg
- Determine the source of the allergic reaction (insect, food, medications, etc.).



## ADULT

### MILD – GENERALIZED URTICARIA ONLY

- **BENADRYL:**
  - 50mg IV/IO/IM, over 2 minutes IV/IO usage
    - **Dilute** with 9mL **NORMAL SALINE** for IV/IO administration

### MODERATE – AIRWAY SWELLING / RESPIRATORY DISTRESS / BRONCHOSPASM / TONGUE AND/OR FACIAL SWELLING

- **EPINEPHRINE (1:1,000, 1mg/mL):**
  - 0.3mg (0.3mL) IM
  - May repeat 2x prn, in 5 minute intervals
  - **Precaution - DO NOT** administer within 5 minutes of Epi-Pen administration
- **BENADRYL:**
  - 50mg IV/IO/IM, over 2 minutes for IV/IO usage
    - **Dilute** with 9mL of **NORMAL SALINE** for IV/IO administration
- **ALBUTEROL:**
  - 2.5mg via nebulizer
  - May repeat prn
- **SOLU-MEDROL:**
  - 125mg IV/IO/IM/PO, over 2 minutes for IV/IO usage

### SEVERE – LOSS OF A RADIAL PULSE OR SBP OF < 90 mm Hg

- **PUSH-DOSE PRESSOR EPINEPHRINE (1:100,000):**
  - **Dilute:** Discard 9 mL of Epi 1:10,000 (0.1mg/mL) and draw up 9 mL of **NORMAL SALINE** to create Push-Dose Pressor Epi 1:100,000. This will yield 10mcg/mL.
    - Administer 1 mL/minute IV/IO, titrate to maintain SBP 100mm Hg
  - May repeat 2x prn, max total dose 300mcg (30 mL)
  - **Contraindications - Hypotension secondary to blood loss**
  - **Precautions:**
    - Rapid (1 minute) onset, short (5-10 minute) duration
    - Monitor heart rate and blood pressure throughout administration
- **NORMAL SALINE:**
  - 1L IV/IO, titrate to desired effect. Assess lung sounds and BP frequently.
  - May repeat 1x prn
  - **Precautions - Particular care must be taken in the presence of significant coronary heart disease, CHF, and renal failure patients**
- **BENADRYL:** as noted above
- **ALBUTEROL:** as noted above
- **SOLU-MEDROL:** as noted above

# Allergic Reaction *continued...*



## PEDIATRIC

### MILD – GENERALIZED URTICARIA ONLY

- BENADRYL:
  - 1mg/kg IV/IO/IM, over 2 minutes for IV/IO usage
    - Dilute with 9mL NORMAL SALINE for IV/IO administration
  - Max single dose 50mg
  - Contraindication - Neonates

### MODERATE – AIRWAY SWELLING / RESPIRATORY DISTRESS / BRONCHOSPASM / TONGUE AND/OR FACIAL SWELLING

- EPINEPHRINE (1:1,000, 1mg/mL):
  - 0.01mg/kg IM, max single dose 0.3mg
  - May repeat 2x prn, in 5 minute intervals
  - Precaution - DO NOT administer within 5 minutes of Epi-Pen administration
- BENADRYL:
  - 1mg/kg IV/IO/IM, over 2 minutes for IV/IO usage
    - Dilute with 9mL NORMAL SALINE for IV/IO administration
  - Max single dose 50mg
  - Contraindication - Neonates
- ALBUTEROL:
  - 2.5mg via nebulizer
  - May repeat prn
- SOLU-MEDROL:
  - 2mg/kg IV/IO/IM/PO, over 2 minutes for IV/IO usage
  - Max single dose 125mg

### SEVERE - LOSS OF A BRACHIAL/RADIAL PULSE OR AGE APPROPRIATE HYPOTENSION

- PUSH-DOSE PRESSOR EPINEPHRINE (1:100,000):
  - Dilute: Discard 9 mL of Epi 1:10,000 (0.1mg/mL) and draw up 9 mL of NORMAL SALINE to create Push-Dose Pressor Epi 1:100,000. This will yield 10mcg/mL.
    - Administer 1 mL/minute IV/IO, titrate to maintain age appropriate SBP
  - May repeat 2x prn, max total dose 300mcg (30 mL)
  - Contraindications - Hypotension secondary to blood loss
  - Precaution:
    - DO NOT administer faster than 1mL/minute
    - Push-Dose Pressor Epinephrine has a rapid (1 minute) onset, short (5-10 minute) duration
    - Monitor heart rate and blood pressure throughout administration
- NORMAL SALINE:
  - 20mL/kg IV/IO, assess lung sounds and BP frequently
  - May repeat 2x prn, for age appropriate hypotension
- BENADRYL: as noted above
- ALBUTEROL: as noted above
- SOLU-MEDROL: as noted above

# ***Diabetic Emergencies***



## **INFORMATION**

- Symptoms of hypoglycemia
  - AMS
  - Slurred speech
  - Dilated pupils
  - Seizures
  - Coma
  - Irritability
- Symptoms of hyperglycemia with Diabetic Ketoacidosis (DKA) include:
  - Nausea/Vomiting
  - Abdominal pain
  - General weakness
  - Kussmaul Respirations (deep rapid respirations)
  - AMS
  - Hypotension
  - Tachycardia with an acetone smell on the patient's breath
- **Diabetic patients taking oral hypoglycemic medications (e.g., Glyburide, Glimepiride, and Glipizide) should always be transported if treated.**



## **ADULT**

### **HYPOGLYCEMIA: BGL < 60 mg/dL**

- **ORAL GLUCOSE:**
  - 15g
  - May repeat 1x prn
  - **Contraindications - Patients who are not conscious enough to swallow**
- **D10:**
  - 100 mL IV/IO
  - Retest glucose
  - May repeat 1x prn

### **HYPOGLYCEMIA: BGL < 60 mg/dL IN CARDIAC ARREST**

- **D10:**
  - 250 mL IV/IO. Rapid infusion

### **HYPERGLYCEMIA: BGL > 300 mg/dL WITH SIGNS & SYMPTOMS OF DKA**

- **NORMAL SALINE:**
  - 1L IV/IO, titrate to desired effect. Assess lung sounds and BP frequently.
  - May repeat 1x prn
  - **Precautions - Particular care must be taken in the presence of significant coronary heart disease, CHF, and renal failure patients**



## **PEDIATRIC**

### **HYPOGLYCEMIA: BGL < 60 mg/dL**

- ORAL GLUCOSE:
  - 15g, if able to swallow and follow commands
  - Contraindications:
    - Patients who are not conscious enough to swallow
    - Patients < 2 years old
- D10:
  - 5mL/kg IV/IO
  - May repeat 1x prn

### **HYPERGLYCEMIA: BGL > 300 mg/dL WITH SIGNS & SYMPTOMS OF DKA**

- NORMAL SALINE:
  - 20mL/kg IV/IO, assess lung sounds and BP frequently
  - May repeat 2x prn, for BGL > 300 mg/dl

# Dystonic Reaction



## INFORMATION

- Dystonic reactions are characterized by intermittent spasmodic or sustained involuntary contractions of muscles in the:
  - Face
  - Neck
  - Trunk
  - Pelvis
  - Extremities
  - Even the larynx
- The following classes of medications are typically responsible for dystonic reactions:
  - Antipsychotic (e.g., Haldol, Risperdal, etc...)
  - Antiemetic (e.g., Compazine, Reglan, Phenergan, etc...)
  - Antidepressant (e.g., Prozac, Paxil, etc...)
- A dystonic reaction can occur immediately or be delayed for hours to days.



## ADULT

- **BENADRYL:**
  - 50mg IV/IO/IM, over 2 minutes for IV/IO usage
    - **Dilute** with 9mL **NORMAL SALINE** for IV/IO administration



## PEDIATRIC

- **BENADRYL:**
  - 1mg/kg IV/IO/IM, over 2 minutes for IV/IO usage
    - **Dilute** with 9mL **NORMAL SALINE** for IV/IO administration
  - Max single dose 50mg
  - **Contraindication - Neonates**

# **Fluid Resuscitation/Dehydration**



## **INFORMATION**

- Indications for fluid resuscitation:
  - Hypotension
  - Fatigue
  - Dark Color Urine
  - Dry Mouth
  - Headache
  - Prolonged vomiting or diarrhea
  - Non-traumatic bleeding (vaginal or GI)
  - Suspected Rhabdomyolysis
  - Paramedic discretion



## **ADULT**

- **NORMAL SALINE:**
  - 1L IV/IO, titrate to desired effect. Assess lung sounds and BP frequently.
  - May repeat 1x prn
  - **Precautions - Particular care must be taken in the presence of significant coronary heart disease, CHF, and renal failure patients**



## **PEDIATRIC**

- **NORMAL SALINE:**
  - 20mL/kg IV/IO, assess lung sounds and BP frequently
  - May repeat 2x prn, for age appropriate hypotension



# Hyperkalemia



## INFORMATION

- Consider hyperkalemia in patients with a history of renal failure/dialysis who are pre-dialysis and present with any of the following:
  - General weakness
  - Cardiac arrhythmias and/or ECG abnormalities:
    - Tall peaked T-waves (most prominent early sign)
    - Sine wave
    - Wide complex QRS
    - Regular Really Wide Complex Tachycardia (RRWCT)
    - Severe bradycardia
    - High degree AV blocks



## ADULT

- Obtain 12 and 15 lead ECGs and leave cables connected

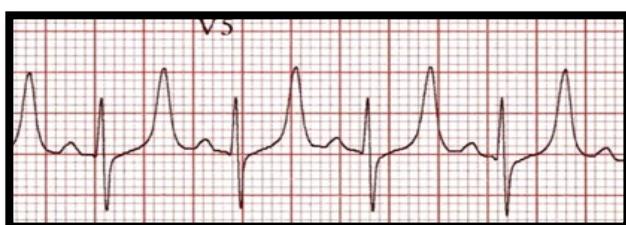
## FOR PATIENTS PRESENTING WITH ANY OF THE ABOVE CARDIAC ARRHYTHMIAS AND/OR ECG ABNORMALITIES

- CALCIUM CHLORIDE:**
  - 1g IV/IO, over 2 minutes
  - Precaution – DO NOT** administer in same IV/IO line as **SODIUM BICARBONATE** without thoroughly flushing
- ALBUTEROL:**
  - 2.5mg via nebulizer
  - Continuous treatments (if an advanced airway is utilized, administer via in-line nebulization)
- SODIUM BICARBONATE:**
  - 100 mEq IV/IO, over 2 minutes
  - Precaution – DO NOT** administer in same IV/IO line as **CALCIUM CHLORIDE** without thoroughly flushing

## IF PATIENT IS HYPOTENSIVE

- NORMAL SALINE:**
  - 500mL IV/IO, titrate to effect. Assess lung sounds frequently.
  - May repeat 1x prn
  - Precautions - Particular care must be taken in the presence of significant coronary heart disease, CHF, and renal failure patients**

### PEAKED T-WAVE



### SINE WAVE



# **Hyperkalemia** *continued...*



## **PEDIATRIC**

- Obtain 12 and 15 lead ECGs and leave cables connected

## **FOR PATIENTS PRESENTING WITH ANY OF THE CARDIAC ARRHYTHMIAS AND/OR ECG ABNORMALITIES ON PREVIOUS PAGE**

### **• CALCIUM CHLORIDE:**

- 20mg/kg IV/IO, over 2 minutes
- Precaution – **DO NOT** administer in same IV/IO line as SODIUM BICARBONATE without thoroughly flushing

### **• ALBUTEROL:**

- 2.5mg via nebulizer
- Continuous treatments (if an advanced airway is utilized, administer via in-line nebulization)

### **• SODIUM BICARBONATE:**

- 1mEq/kg IV/IO, over 2 minutes, max single dose 50mEq
- May repeat 1x prn, in 5 minutes. Max total dose 100mEq
- Precaution – **DO NOT** administer in same IV/IO line as CALCIUM CHLORIDE without thoroughly flushing

## **IF PATIENT IS HYPOTENSIVE**

### **• NORMAL SALINE:**

- 10mL/kg IV/IO, titrate to effect. Assess lung sounds frequently.
- May repeat 1x prn
- Precautions - Particular care must be taken in the presence of significant coronary heart disease, CHF, and renal failure patients



# Nausea/Vomiting



## INFORMATION

- Consider differential diagnosis:
  - Cardiac
  - Stroke
  - Diabetic
  - Head Injury
  - Other



## ADULT

- Obtain 12 and 15 lead ECGs and leave cables connected
- **NORMAL SALINE:**
  - 1L IV/IO, titrate to desired effect. Assess lung sounds and BP frequently.
  - May repeat 1x prn
  - **Precautions - Particular care must be taken in the presence of significant coronary heart disease, CHF, and renal failure patients**
- **ZOFRAN:**
  - 4mg IV/IO/IM/PO, over 2 minutes for IV/IO usage
  - May repeat 1x prn



## PEDIATRIC

- Obtain 12 and 15 lead ECGs and leave cables connected
- **NORMAL SALINE:**
  - 20mL/kg IV/IO, assess lung sounds and BP frequently
  - May repeat 2x prn, for age appropriate hypotension
- **ZOFRAN:**
  - 0.1mg/kg IV/IO/IM/PO, over 2 minutes for IV/IO usage
  - Max single dose 4mg



# Respiratory Distress



## INFORMATION

- Patients with COPD & Asthma have prolonged exhalation secondary to bronchospasm, which causes air trapping resulting in hypercapnia (high levels of CO<sub>2</sub>). Therefore, EtCO<sub>2</sub> guidelines should be disregarded for these patients, as it is more important to maintain SpO<sub>2</sub> levels at 90%. Trying to maintain normal EtCO<sub>2</sub> levels in these patients puts them at risk for developing Auto PEEP, which can result in a pneumothorax or hypotension.
- Auto PEEP occurs during assisted ventilations when air goes in before the patient is allowed to fully exhale. This causes the lungs to expand like a balloon, putting the patient at risk for a pneumothorax. In addition, increasing intrathoracic pressure can decrease venous return to the heart which can result in hypotension.
- COPD or Asthma patients who develop poor bag compliance or hypotension during positive pressure ventilations should have positive pressure ventilations discontinued to allow the patient to completely exhale before resuming positive pressure ventilations.
  - If patient has an advanced airway, disconnect BVM to allow patient to exhale
  - Positive pressure ventilations should be discontinued for:
    - Adults: 20-40 seconds
    - Pediatric: 10-20 seconds



## ADULT

### BRONCHOSPASM SECONDARY TO COPD or ASTHMA

- **ALBUTEROL:**
  - 2.5mg via nebulizer. May be administered simultaneously with CPAP
  - May repeat prn
- **SOLU-MEDROL:**
  - 125mg IV/IO/IM/PO, over 2 minutes for IV/IO usage

### FOR SEVERE ASTHMA NOT RESPONDING TO ABOVE TREATMENT

- **EPINEPHRINE (1:1,000, 1mg/mL):**
  - 0.3mg (0.3mL) IM
  - May repeat 2x prn, in 5 minute intervals
- **MAGNESIUM SULFATE:**
  - **Dilute:** 2g of Magnesium Sulfate in a 50mL bag of **NORMAL SALINE**
    - Administer over 10 minutes IV/IO by utilizing a 15 gtt set delivering 75 gtt/min (1.25 gtt/sec)
  - **Contraindication - 2<sup>nd</sup> and 3<sup>rd</sup> Degree Heart Blocks**
  - **Precaution - Rapid infusion may cause hypotension**

### MODERATE OR SEVERE RESPIRATORY DISTRESS: (INCLUDING COPD, ASTHMA, AND PNEUMONIA)

- **CPAP - 10 cm H<sub>2</sub>O:**
  - **Contraindications:**
    - SBP < 90mm Hg
    - Patients without spontaneous respirations
    - Patients with a decreased LOC (lethargic)
    - Patients < 30 kg

### **WARNING**

Immediately remove the CPAP for the asthmatic patient whose condition worsens after applying the CPAP

# **Respiratory Distress** *continued...*



## **PEDIATRIC**

### **BRONCHOSPASM**

- **ALBUTEROL:**
  - 2.5mg via nebulizer
  - May repeat prn
- **SOLU-MEDROL:**
  - 2mg/kg IV/IO/IM/PO, over 2 minutes for IV/IO usage
  - Max single dose 125mg

### **FOR SEVERE ASTHMA NOT RESPONDING TO ABOVE TREATMENT**

- **EPINEPHRINE (1:1,000, 1mg/mL):**
  - 0.01mg/kg IM, max single dose 0.3mg
  - May repeat 2x prn, in 5 minute intervals.
- **MAGNESIUM SULFATE:**
  - **Dilute:** 40mg/kg in a 50mL bag of **NORMAL SALINE**
    - Administer over 25 minutes IV/IO by utilizing a 15 gtt set delivering 30gtts/min (1gtts/2sec)
  - **Contraindication - 2<sup>nd</sup> and 3<sup>rd</sup> Degree Heart Blocks**
  - **Precaution - Rapid infusion may cause hypotension**

### **FOR CROUP/EPIGLOTTITIS**

- **EPINEPHRINE (1:1,000, 1mg/mL):**
  - 3mg (3mL total) delivered via nebulizer
  - **Precautions:**
    - **DO NOT** stress the patient
    - **DO NOT** attempt to intubate or place an OPA or NPA
- Ventilate via BVM as needed
- Expedite transport to closest Comprehensive Pediatric ED

#### **Croup:**

- Usually < 3 years old
- “Sick” for a couple of days
- Low grade fever
- Not toxic appearing

#### **Epiglottitis:**

- Usually 3-6 years old
- Sudden onset
- High grade fever
- Poor general impression
- Drooling
- Tripod position

**BOTH HAVE STRIDOR AND/OR A “BARKY” COUGH**

# Seizure



## INFORMATION

- Consider the possible causes:
  - Meningitis
  - Fever
  - Head trauma
  - Hemorrhagic stroke
  - Drugs
  - Alcohol
  - Diabetic
  - Poisoning
- Monitoring of EtCO<sub>2</sub> shall be performed to determine the patient's respiratory status.
- Refer to the "Eclampsia" protocol (pg. 121), for pregnant patients.



## ADULT

### IF ACTIVELY SEIZING

- **VERSED:**
  - 5mg IV/IO/IN/IM
  - May repeat 1x prn, in 5 minutes if seizure reoccurs or does not subside
  - **Contraindication - Hypotension**
  - **Precaution - Monitor for respiratory depression**

### IF SEIZURE DOES NOT RESPOND TO ABOVE TREATMENT

- **KETAMINE** with **EMS CAPTAIN approval:**
  - **Dilute:** 100mg of Ketamine in a 50mL bag of **NORMAL SALINE**
    - Administer IV/IO utilizing a 60 gtt set, run wide open
  - **Contraindications:**
    - Pregnant patients
    - Penetrating eye injury
    - Non-traumatic chest pain
  - **Precautions:**
    - Be prepared for advanced airway management
    - Rapid IV administration is associated with respiratory depression, apnea, and higher than usual increases in blood pressures
    - May increase schizophrenic symptoms

OR

### IF UNABLE TO ESTABLISH VASCULAR ACCESS

- **KETAMINE:**
  - 100mg IN/IM
  - **Contraindications - as noted above**
  - **Precautions - as noted above**

# ***Seizure***



## **PEDIATRIC**

### **FEBRILE SEIZURE**

- **ACTIVE COOLING:** Remove the clothing
- **DO NOT** cover patient with a wet towel or sheet
- **DO NOT** apply ice or cold packs to the patient's body

### **IF ACTIVELY SEIZING**

- **VERSED:**
  - 0.1 mg/kg IV/IO, max single dose 5mg
  - 0.2 mg/kg IN/IM, max single dose of 5mg
  - May repeat either route 1x prn, in 5 minutes if seizure reoccurs or does not subside
  - **Contraindication - Hypotension**
  - **Precaution - Monitor for respiratory depression**

### **IF SEIZURE DOES NOT RESPOND TO ABOVE TREATMENT ( $\geq 3$ YEARS OLD)**

- **KETAMINE** with **EMS CAPTAIN approval:**
  - 1mg/kg IN/IM
  - May repeat 1x prn, in 5 minutes
  - **Contraindications:**
    - Penetrating eye injury
  - **Precautions:**
    - Be prepared for advanced airway management
    - May increase schizophrenic symptoms

# Sepsis



## INFORMATION

- Sources, signs & symptoms of sepsis include, but are not limited to:
  - Fever
  - UTI (Increased urinary frequency, dysuria, and/or cloudy, bloody, or foul smelling urine)
  - Pneumonia (productive cough, green/yellow/brown sputum)
  - Wounds or insertion sites that are: Painful/red/swollen or have a purulent (pus) discharge
  - Patient is on antibiotics and has significant diarrhea, abdominal pain or tenderness
  - Recent history of surgery/invasive medical procedure (e.g., Foley Catheter, Central Lines, etc...)
  - AMS and/or poor oral intake over the past 24-48 hours (especially in the elderly)
  - Bed sores, abscesses, cellulitis, or immobility
- Transport all Sepsis Alerts as Priority 2.

### SEPSIS ALERT Criteria

If all of the following are met, call a SEPSIS ALERT:

- Adult and **NOT** pregnant
- AND**
- Suspected or documented infection
- AND**
- At least **TWO (2) POINTS** of the **H.A.T** criteria (max score of 3 points)
  - **H**- Hypotension (SBP < 100 mm Hg) = **1 point**
  - **A**- Altered Mental Status or GCS ≤ 14 (new onset) = **1 point**
  - **T**- Tachypnea (respiratory rate > 22) **AND/OR** EtCO<sub>2</sub> (< 25 mm Hg) = **1 point**

### WARNING

It is imperative once sepsis is identified, that the patient is kept from becoming hypotensive, as an episode of hypotension significantly increases morbidity and mortality

### WARNING

- Pneumonia patients with rales still require IV fluids
- Monitor EtCO<sub>2</sub> and SpO<sub>2</sub> during fluid administration



# Sepsis *continued...*



## ADULT

### SEPSIS ALERT

- **NORMAL SALINE:**
  - 1L IV/IO, assess lung sounds and BP frequently
  - **MUST** repeat 1x if time permits
  - Precautions - Particular care must be taken in the presence of significant coronary heart disease, CHF, and renal failure patients
- **CEFTRIAXONE (ROCEPHIN) (ADMINISTER BOTH ANTIBIOTICS UNLESS CONTRAINDICATED):**
  - Reconstitute 2g of Ceftriaxone using 20 mL of **NORMAL SALINE** in the medication vial
  - **Dilute:** 2g of Ceftriaxone in a 50mL bag of **NORMAL SALINE**
    - Administer over 10 minutes IV/IO by utilizing a 15 gtt set delivering 75 gtts/min (1.25 gtts/sec)
  - **Contraindication:**
    - Allergy to Cephalosporin antibiotics (e.g., Ancef, Ceclor, Cefdinir, Keflex)
    - Artificial heart valve replacement
- **GENTAMICIN (ADMINISTER BOTH ANTIBIOTICS UNLESS CONTRAINDICATED):**
  - 80 mg IM
  - **Contraindication:**
    - Allergy to Aminoglycoside antibiotics (e.g., Paromycin, Tobramycin, Neomycin)
    - Artificial heart valve replacement

### IF PATIENT REMAINS HYPOTENSIVE

- **PUSH-DOSE PRESSOR EPINEPHRINE (1:100,000):**
  - **Dilute:** Discard 9 mL of Epi 1:10,000 (0.1mg/mL) and draw up 9 mL of **NORMAL SALINE** to create Push-Dose Pressor Epi 1:100,000. This will yield 10mcg/mL.
    - Administer 1 mL/minute IV/IO, titrate to maintain SBP 100mm Hg
  - May repeat 2x prn, max total dose 300mcg (30 mL)
  - **Contraindications - Hypotension secondary to blood loss**
  - **Precautions:**
    - Rapid (1 minute) onset, short (5-10 minute) duration
    - Monitor heart rate and blood pressure throughout administration



## PEDIATRIC

### SUSPECTED SEPSIS

- **NORMAL SALINE:**
  - 20mL/kg IV/IO, regardless of blood pressure, assess lung sounds frequently
  - May repeat 2x prn, for age appropriate hypotension

### IF PATIENT REMAINS HYPOTENSIVE (AGE APPROPRIATE HYPOTENSION)

- **PUSH-DOSE PRESSOR EPINEPHRINE (1:100,000):**
  - **Dilute:** Discard 9 mL of Epi 1:10,000 (0.1mg/mL) and draw up 9 mL of **NORMAL SALINE** to create Push-Dose Pressor Epi 1:100,000. This will yield 10mcg/mL.
    - Administer 1 mL/minute IV/IO, titrate to maintain age appropriate SBP
  - May repeat 2x prn, max total dose 300mcg (30 mL)
  - **Contraindications - Hypotension secondary to blood loss**
  - **Precaution:**
    - **DO NOT** administer faster than 1mL/minute
    - Push-Dose Pressor Epinephrine has a rapid (1 minute) onset, short (5-10 minute) duration
    - Monitor heart rate and blood pressure throughout administration

# Stroke



## INFORMATION

### WITNESSED

- Spouse, family, friends or bystander can identify that the signs and symptoms have developed within **24 hours**. Witnessed symptoms **> 24 hours** shall not be considered stroke alerts

### UNWITNESSED

- Onset of signs and symptoms are unable to be determined

### ASSESSMENTS

- Cincinnati Stroke Scale shall be initial stroke assessment.
- If Stroke suspected, patient shall receive a R.A.C.E. "+" (plus) assessment

### CRITERIA

#### **STROKE ALERT CRITERIA:**

- Any new positive finding from the Cincinnati Stroke Scale
- R.A.C.E. (plus) assessment score  $> 0$
- **All witnessed (within 24 hours) and unwitnessed (unknown onset) strokes will be transported as stroke alerts**

### TRANSPORT

- All Stroke Alerts shall **ONLY** be transported to a **COMPREHENSIVE STROKE CENTER**
  - **Exception: Known terminal illness or Hospice Care patients can still be treated as a STROKE ALERT. Transport these patients to the closest Stroke Center (Primary OR Comprehensive).**
- **Immediate notification of a Stroke Alert with the R.A.C.E (plus) score needs to be relayed to the RECEIVING STROKE CENTER.**

	ITEM	ASSESSMENT	R.A.C.E. "+" (plus) SCORE
MOTOR	Facial Palsy	Ask the patient to show their teeth: "Smile"	0 – Absent (symmetrical movement) 1 – Mild (slightly asymmetrical) 2 – Moderate to Severe (completely asymmetrical)
	Arm Motor Function	Extend the arms of the patient 90 degrees (if sitting) or 45 degree (if supine) palms up	0 – Normal to mild (limb upheld $> 10$ seconds) 1 – Moderate (limb upheld $< 10$ seconds) 2 – Severe (patient unable to raise arms against gravity)
	Leg Motor Function	Extend the leg of the patient 30 degrees (if supine) 1 leg at a time	0 – Normal to mild (limb upheld $> 5$ seconds) 1 – Moderate (limb upheld $< 5$ seconds) 2 – Severe (patient unable to raise leg against gravity)
CORTICAL	Head and Eye Gaze Deviation	Observe range of motion of eyes and look for head turning to 1 side	0 – Absent (normal eye movement to both sides, and no head deviation was observed) 1 – Present (eyes and/or head deviation to 1 side was observed)
	Aphasia	Ask the patient to follow 2 verbal orders: "Close your eyes" and "Make a fist"	0 – Normal (performs both tasks correctly) 1 – Moderate (performs 1 task correctly) 2 – Severe (performs neither task)
	Agnosia	Ask the patient: "Who's arm is this?" when showing him or her the weak arm or "Can you move your arm?"	0 – Normal appropriate or correct answer 1 – Moderate (does not recognize limb or cannot move it) 2 – Severe (both of them)
If <b>Cortical Signs</b> are present add a "+" (plus) sign next to total score and include the verbiage "plus" with encode.		R.A.C.E. SCALE TOTAL: <b>Max Score of 11</b>	

ALL ITEMS SHALL BE EVALUATED REGARDLESS OF LEFT OR RIGHT WEAKNESS



## **ADULT & PEDIATRIC**



- Obtain the following information:
  - Last time seen asymptomatic
  - Witness name
  - Witness phone number(s)
  - Patient's medications



## **ADULT**

- **OBTAINT A BGL**
- **POSITIONING:**
  - Supine:
    - All patients with the exception of those listed under 30° head elevation section
  - 30° head elevation:
    - A diagnosed intracerebral hemorrhage (interfacility transport)
    - Patient is short of breath
- **OXYGEN:**
  - 2 LPM NC regardless of pulse oximetry reading. Increase oxygen therapy as needed
- **IV ACCESS:**
  - Establish an 18g catheter, the antecubital is preferred
- **NORMAL SALINE:**
  - 500mL IV/IO, regardless of the blood pressure



## **PEDIATRIC**

- **OBTAINT A BGL**
- **POSITIONING:**
  - Supine:
    - All patients with the exception of those listed under 30° head elevation section
  - 30° head elevation:
    - A diagnosed intracerebral hemorrhage (interfacility)
    - Patients short of breath
- **OXYGEN:**
  - 2 LPM NC regardless of pulse oximetry reading. Increase oxygen therapy as needed
- **IV ACCESS:**
  - Establish an appropriate sized catheter
    - The antecubital is preferred
- **NORMAL SALINE:**
  - 10mL/kg IV/IO, regardless of the blood pressure, max dose 250 mL
- **TRANSPORT:**
  - **ALL PEDIATRIC** Stroke Alerts SHALL be transported to St. Mary's Comprehensive Stroke Center



# Cardiac Emergencies

*Atrial Fibrillation/Flutter (p. 49)*

*Bradycardia (p. 50)*

*Cardiogenic Shock (p. 52)*

*Chest Pain (p. 53)*

*STEMI Alert (p. 54)*

*CHF (Pulmonary Edema) (p. 56)*

*Supraventricular Tachycardia (p. 57)*

*Wide Complex Tachycardia (p. 59)*

*Regular Really Wide Complex Tachycardia  
(p. 61)*

*Polymorphic V-Tach (p. 63)*

*Left Ventricular Assist Device (p. 65)*

# Rapid A-Fib & A-Flutter



## INFORMATION

- Rapid atrial fibrillation and atrial flutter are defined as ventricular rates > 150 beats per minute



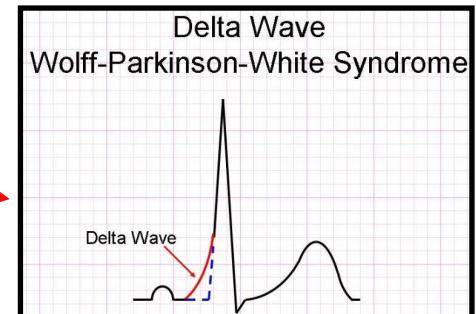
## ADULT

- Obtain 12 and 15 lead ECGs and leave cables connected

## STABLE

- CARDIZEM:

- 10 mg IV/IO, over 2 minutes
- If no response in 5 minutes, repeat with 15 mg IV/IO, over 2 minutes
- Contraindication:
  - Hypotension
  - Wide complex QRS
  - History of WPW
  - Sick sinus syndrome
  - Heart blocks
- Precautions:
  - Use with caution for patients taking beta blockers
  - May cause hypotension, see treatment below



## UNSTABLE (HYPOTENSION)

- NORMAL SALINE:

- 1L IV/IO, titrate to desired effect. Assess lung sounds and BP frequently.
- May repeat 1x prn
- Precautions - Particular care must be taken in the presence of significant coronary heart disease, CHF, and renal failure patients

## IF PATIENT REMAINS HYPOTENSIVE AFTER FLUID ADMINISTRATION

- PUSH-DOSE PRESSOR EPINEPHRINE (1:100,000):

- Dilute: Discard 9 mL of Epi 1:10,000 (0.1mg/mL) and draw up 9 mL of NORMAL SALINE to create Push-Dose Pressor Epi 1:100,000. This will yield 10mcg/mL.
  - Administer 1 mL/minute IV/IO, titrate to maintain SBP 100mm Hg
- May repeat 2x prn, max total dose 300mcg (30 mL)
- Contraindications - Hypotension secondary to blood loss
- Precautions:
  - Rapid (1 minute) onset, short (5-10 minute) duration
  - Monitor heart rate and blood pressure throughout administration

## IF PATIENT BECOMES NORMOTENSIVE AFTER FLUID ADMINISTRATION OR PUSH-DOSE PRESSOR EPINEPHRINE

- CARDIZEM: as noted above



## CARDIZEM INDUCED HYPOTENSION

- NORMAL SALINE: as noted above
- CALCIUM CHLORIDE:
  - 500mg IV/IO, over 2 minutes

## PEDIATRIC

- Call for orders

**WARNING**  
**DO NOT** cardiovert A-Fib/A-Flutter.  
Cardioversion of unstable A-Fib/A-Flutter  
may put patients at high risk  
for embolic stroke.



# Bradycardia



## INFORMATION

- Bradycardia is defined as a heart rate < 50 beats per minute.



## ADULT

- Obtain 12 and 15 lead ECGs and leave cables connected

## STABLE

- Monitor and transport

## UNSTABLE (HYPOTENSIVE)

### • ATROPINE:

- 0.5mg IV/IO
- May repeat prn, in 3 minute intervals, max total dose 3mg
- Contraindication - Bradycardia in the presence of a myocardial infarction

## IF PATIENT DETERIORATES OR HYPOTENSION PERSISTS AFTER 2 DOSES OF ATROPINE

### • TRANSCUTANEOUS PACING:

- Initial rate of 60 beats per minute and increase millamps until capture is gained
- Increase the rate as needed until the patient is hemodynamically stable

## SEDATION FOR TRANSCUTANEOUS PACING

### • DO NOT DELAY TRANSCUTANEOUS PACING TO ESTABLISH IV ACCESS

### • ETOMIDATE:

- 6mg IV/IO
- May repeat 1x prn

OR

## IF UNABLE TO ESTABLISH VASCULAR ACCESS AND PATIENT BECOMES NORMOTENSIVE SECONDARY TO TRANSCUTANEOUS PACING

### • VERSED:

- 5mg IN/IM
- May repeat 1x prn, in 5 minutes
- Contraindication - Hypotension
- Precaution - Monitor for respiratory depression

## IF PATIENT REMAINS HYPOTENSIVE AFTER ATROPINE OR TRANSCUTANEOUS PACING

### • PUSH-DOSE PRESSOR EPINEPHRINE (1:100,000):

- Dilute: Discard 9 mL of Epi 1:10,000 (0.1mg/mL) and draw up 9 mL of NORMAL SALINE to create Push-Dose Pressor Epi 1:100,000. This will yield 10mcg/mL.
  - Administer 1 mL/minute IV/IO, titrate to maintain SBP 100mm Hg
- May repeat 2x prn, max total dose 300mcg (30 mL)
- Contraindications - Hypotension secondary to blood loss
- Precautions:
  - Rapid (1 minute) onset, short (5-10 minute) duration
  - Monitor heart rate and blood pressure throughout administration

## WARNING

- Go directly to transcutaneous pacing for unstable bradycardia in the presence of a myocardial infarction as ATROPINE increases myocardial ischemia and may increase the size of the infarct.



# Bradycardia *continued...*



## PEDIATRIC

- Obtain 12 and 15 lead ECGs and leave cables connected

## STABLE

### OXYGENATION:

- Ensure adequate oxygenation first, as hypoxia is most likely to be the cause of the bradycardia
- Monitor and transport

## UNSTABLE (AMS AND AGE APPROPRIATE HYPOTENSION)

- Ensure adequate oxygenation and ventilation first, as hypoxia is most likely to be the cause of the bradycardia
- **VENTILATION:**
  - Neonates:
    - 1 breath every 3 seconds for at least 30 seconds
  - Infants/Children:
    - 1 breath every 3 seconds for at least 1 minute
- **CHEST COMPRESSIONS: (IF PATIENT REMAINS UNSTABLE AFTER VENTILATIONS AND THE HEART RATE REMAINS BELOW 60 BEATS PER MINUTE)**
  - 220 compressions every 2 minutes

## IF NO RESPONSE TO OXYGENATION, VENTILATION, AND CHEST COMPRESSIONS

### PUSH-DOSE PRESSOR EPINEPHRINE (1:100,000):

- **Dilute:** Discard 9 mL of Epi 1:10,000 (0.1mg/mL) and draw up 9 mL of **NORMAL SALINE** to create Push-Dose Pressor Epi 1:100,000. This will yield 10mcg/mL.
  - Administer 1 mL/minute IV/IO, titrate to maintain age appropriate SBP
- May repeat 2x prn, max total dose 300mcg (30 mL)
- **Contraindications - Hypotension secondary to blood loss**
- **Precaution:**
  - **DO NOT** administer faster than 1mL/minute
  - Push-Dose Pressor Epinephrine has a rapid (1 minute) onset, short (5-10 minute) duration
  - Monitor heart rate and blood pressure throughout administration

## IF BRADYCARDIC AND AGE APPROPRIATE HYPOTENSION PERSISTS AFTER INITIAL DOSE OF EPINEPHRINE

### TRANSCUTANEOUS PACING:

- Initial rate of **80** beats per minute and increase millamps until capture is gained
- Increase the rate as needed until the patient is hemodynamically stable

## SEDATION FOR TRANSCUTANEOUS PACING

### DO NOT DELAY TRANSCUTANEOUS PACING TO ESTABLISH IV ACCESS

### ETOMIDATE:

- 0.1mg/kg IV/IO, over 30 seconds, max single dose 6mg
- May repeat 1x prn

**OR**

## IF UNABLE TO ESTABLISH VASCULAR ACCESS AND PATIENT BECOMES NORMOTENSIVE SECONDARY TO TRANSCUTANEOUS PACING

### VERSED

- 0.2 mg/kg IN/IM, max single dose of 5mg
- May repeat either route 1x prn, in 5 minutes
- **Contraindication - Hypotension**
- **Precaution - Monitor for respiratory depression**



# Cardiogenic Shock



## INFORMATION

- Cardiogenic shock can be characterized as the following:
  - A condition in which the heart suddenly can't pump enough blood to meet the body's needs
  - Most often caused by a severe heart attack
  - Rare, but often fatal if not treated immediately



## ADULT

- Obtain 12 and 15 lead ECGs and leave cables connected

### PULMONARY EDEMA WITH HYPOTENSION

- **PUSH-DOSE PRESSOR EPINEPHRINE (1:100,000):**
  - **Dilute:** Discard 9 mL of Epi 1:10,000 (0.1mg/mL) and draw up 9 mL of **NORMAL SALINE** to create Push-Dose Pressor Epi 1:100,000. This will yield 10mcg/mL.
    - Administer 1 mL/minute IV/IO, titrate to maintain SBP 100mm Hg
  - May repeat 2x prn, max total dose 300mcg (30 mL)
  - **Contraindications - Hypotension secondary to blood loss**
  - **Precautions:**
    - Rapid (1 minute) onset, short (5-10 minute) duration
    - Monitor heart rate and blood pressure throughout administration
- **NORMAL SALINE:**
  - 1L IV/IO, titrate to desired effect. Assess lung sounds and BP frequently.
  - May repeat 1x prn
  - **Precautions - Particular care must be taken in the presence of significant coronary heart disease, CHF, and renal failure patients**

### WARNING

- **Once SBP is 100mm Hg or greater:**
  - **Refer to the "CHF (Pulmonary Edema)" protocol (pg. 56)**
  - **DO NOT ADMINISTER NTG FOR THESE PATIENTS**



## PEDIATRIC

### PULMONARY EDEMA WITH AGE APPROPRIATE HYPOTENSION

- **PUSH-DOSE PRESSOR EPINEPHRINE (1:100,000):**
  - **Dilute:** Discard 9 mL of Epi 1:10,000 (0.1mg/mL) and draw up 9 mL of **NORMAL SALINE** to create Push-Dose Pressor Epi 1:100,000. This will yield 10mcg/mL.
    - Administer 1 mL/minute IV/IO, titrate to maintain age appropriate SBP
  - May repeat 2x prn, max total dose 300mcg (30 mL)
  - **Contraindications - Hypotension secondary to blood loss**
  - **Precaution:**
    - **DO NOT** administer faster than 1mL/minute
    - Push-Dose Pressor Epinephrine has a rapid (1 minute) onset, short (5-10 minute) duration
    - Monitor heart rate and blood pressure throughout administration
- **NORMAL SALINE:**
  - 20 mL/kg IV/IO, assess lung sounds and BP frequently
  - May repeat 2x prn, for age appropriate hypotension



# Chest Pain



## INFORMATION

- Assume chest pain to be cardiac in nature until ruled out.



## ADULT

- Obtain 12 and 15 lead ECGs and leave cables connected
- The right hand and right wrist should be avoided for vascular access if at all possible. These sites may be utilized for cardiac catheterization.
- The right AC and anywhere on the left is acceptable
- ASPIRIN:**
  - 324 mg
  - Contraindications:**
    - < 16 years old
    - Active GI bleeding
  - Precaution - Unless the patient has taken 324mg within 24 hours, administer full dose
- FENTANYL:**
  - 100mcg IV/IO/IN/IM
  - May repeat 2x prn, in 5 minute intervals
  - Contraindication - Pregnancy near term (32 weeks or greater) or in active labor**
    - Precaution:
      - History of opiate abuse or drug seeking behavior
      - Monitor patient for respiratory depression
      - Discontinue if patient becomes drowsy
      - Can be reversed with NARCAN if necessary

## IF PAIN/DISCOMFORT PERSISTS AFTER MAXIMUM FENTANYL ADMINISTRATION OR DRUG SEEKING BEHAVIOR IS SUSPECTED

- NITROGLYCERIN:**
  - 0.4mg SL
  - May repeat 2x prn, in 5 minute intervals
  - Contraindications:**
    - SBP < 90 mm Hg
    - Heart Rate < 50 beats per minute or > 100 beats per minute
    - EDD (Viagra and Levitra within 24 hours and Cialis within 48 hours).
    - Right Ventricular Infarction (positive V4R) (refer to the "STEMI" protocol [pg. 55] for right ventricular failure)
    - STEMI



## PEDIATRIC

- Call for orders

Patients experiencing chest pain shall have multiple 12 and 15 lead ECGs performed throughout assessment and transport

# STEMI Alert



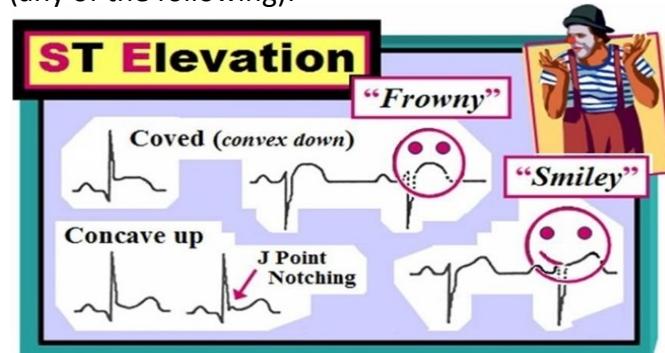
## INFORMATION

- This protocol may be run concurrent with the chest pain protocol as applicable.
- STEMI Symptoms can be various and include:
  - Discomfort of the chest, arm, neck, back, shoulder or jaw
  - Syncope or near syncope
  - General weakness
  - Unexplained diaphoresis
  - SOB
  - Nausea/Vomiting



## STEMI ALERT CRITERIA

- ST-Segment Elevation in 2 or more contiguous leads:
  - Convex (frown face) or straight morphology (any of the following):
    - 2mm or greater in V2 and V3
    - 1mm or greater in all other leads
  - Concave (smiley face) morphology
    - 2mm or greater in any lead
- All STEMI Alerts shall be transported as priority 2

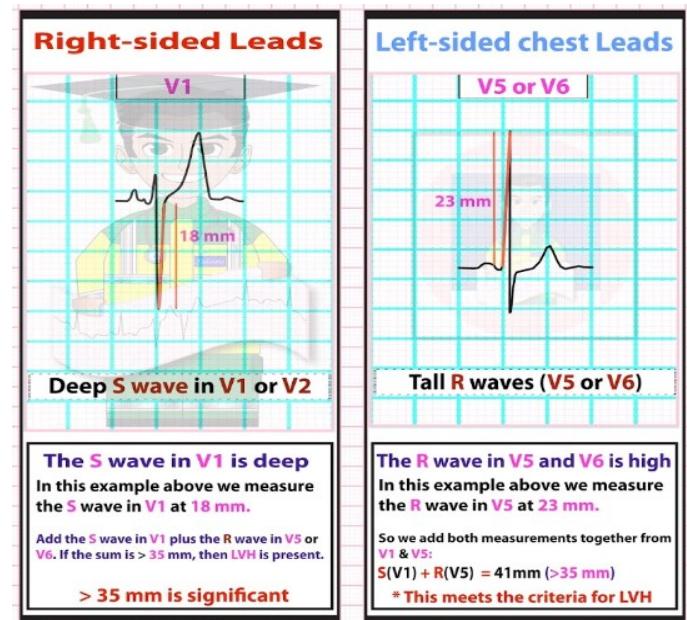


## STEMI ALERT DISQUALIFIERS

- The following are STEMI mimics:
  - Left Bundle Branch Block (QRS complexes > 0.12)
  - Pacemaker with QRS complexes > 0.12
  - Left Ventricular Hypertrophy (LVH)
  - Early repolarization
  - < 2mm of elevation with a concave (smiley face) morphology
- Patient presentations indicative of myocardial ischemia that **DO NOT** meet "STEMI Alert Criteria" should still be transported **Priority 2 to a STEMI facility**

## LEFT VENTRICULAR HYPERTROPHY FORMULA (LVH)

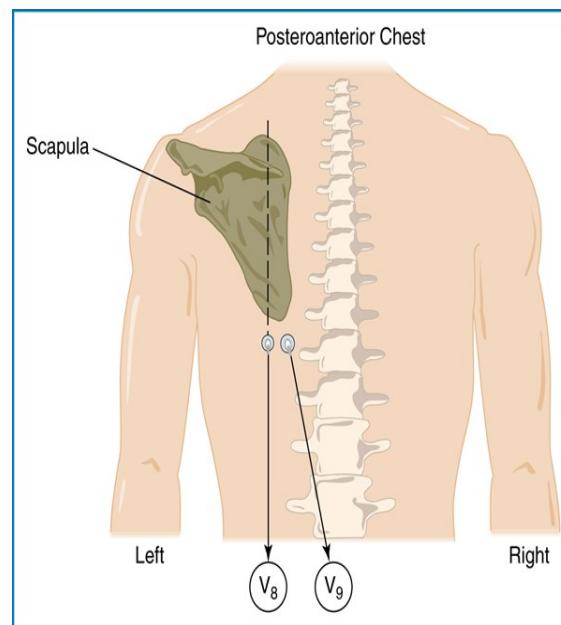
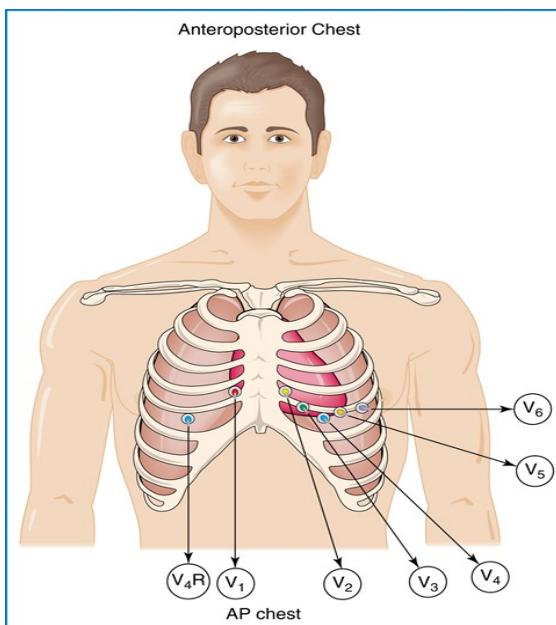
- Count the small boxes of V1 and V2 ("S" wave), the largest negative deflection from the isoelectric line (whichever is larger)
- Count the small boxes of V5 or V6 ("R" wave), the largest positive deflection from the isoelectric line (whichever is larger)
- Add the 2, if the result is > 35, suspect LVH





## 15-LEAD ECG

- Run the first 12 lead as always
- The following patients shall receive a 15-lead ECG:
  - All patients requiring a 12 lead ECG
- Placement:
  - Unsnap wires for V4, V5, and V6 (leave the other leads where they are)
  - Place V4 on V4R (5<sup>th</sup> intercostal space, midclavicular line *right* side)
  - Place V5 on V8 (5<sup>th</sup> intercostal space midscapular)
  - V6 for V9 as below (5<sup>th</sup> intercostal space between V8 and spine)
  - Run a 2<sup>nd</sup> 12 lead (which is now the 15 lead)
- Relabel the new leads on the printed ECG



## RIGHT VENTRICULAR FAILURE: POSITIVE V4R, CLEAR LUNG SOUNDS WITH HYPOTENSION

- **NORMAL SALINE:**
  - 1L IV/IO, titrate to desired effect. Assess lung sounds and BP frequently.
  - May repeat 1x prn
  - **Precautions - Particular care must be taken in the presence of significant coronary heart disease, CHF, and renal failure patients**
- If pulmonary edema and hypotension present, refer to Cardiogenic Shock protocol (pg. 52)

## WITH OR WITHOUT CHEST PAIN

- **ASPIRIN**
  - 324 mg
  - **Contraindications:**
    - < 16 years old
    - Active GI bleeding
  - **Precaution - Unless the patient has taken 324mg within 24 hours, administer full dose**



# CHF (Pulmonary Edema)



## INFORMATION

- **Signs & Symptoms:**

- Hypertension
- Tachycardia
- Orthopnea (SOB while lying flat)
- Rales
- Pedal Edema



## ADULT

- Obtain 12 and 15 lead ECGs and leave cables connected
- **NITROGLYCERIN:**
  - 0.8mg SL (2 tablets)
  - May repeat with 0.4mg SL (1 tablet), 2x prn, every 5 minutes
  - **Contraindications:**
    - SBP < 90 mm Hg
    - Heart Rate < 50 beats per minute
    - EDD (Viagra and Levitra within 24 hours and Cialis within 48 hours).
    - Right Ventricular Infarction (positive V4R) (refer to the “STEMI” protocol [pg. 55] for right ventricular failure)
    - STEMI
- **CPAP - (10 cm H<sub>2</sub>O):**
  - **Contraindications:**
    - SBP < 90 mm Hg
    - Patients without spontaneous respirations
    - Patients with a decreased LOC (lethargic)
    - Patients < 30 kg
- **NITRO-PASTE:**
  - Apply 1" to the anterior upper chest
  - **Contraindications:**
    - SBP < 90 mm Hg
    - Heart Rate < 50 beats per minute
    - EDD (Viagra and Levitra within 24 hours and Cialis within 48 hours).
    - Right Ventricular Infarction (positive V4R) (refer to the “STEMI” protocol [pg. 55] for right ventricular failure)
    - STEMI
  - **Precaution:**
    - Apply with the dosage measuring applicator and secure with tape
    - **DO NOT** use the equipment supplied to secure an IV



## PEDIATRIC

- Call for orders

### **WARNING**

If patient is febrile or from a nursing home and pneumonia is suspected withhold nitrates



# Supraventricular Tachycardia



## INFORMATION

- The distinction between **Sinus Tachycardia** (ST) and **Supraventricular Tachycardia** (SVT) can be difficult at very rapid rates. Utilize the following criteria to assist in determination of Sinus Tachycardia vs SVT:
  - SVT will generally have no discernible P-waves or there may be P-waves just after the QRS complex
  - History that favors Sinus Tachycardia (e.g., dehydration, fever, pain, anxiety, physical activity, exertional heat stroke, etc.)
  - Vagal maneuvers may gently slow down Sinus Tachycardia but will either not affect SVT **OR** abruptly break the SVT (SVT shouldn't gently terminate).
  - Adult:**
    - QRS width **< 0.12 (3 small boxes)**
    - Rate > 150 beats per minute after Sinus Tachycardia has been ruled out
  - Pediatric:**
    - QRS width **< 0.09 (2 small boxes)**
    - SVT in pediatrics is considered > 180 beats per minute
    - SVT in infants is considered > 220 beats per minute



## ADULT

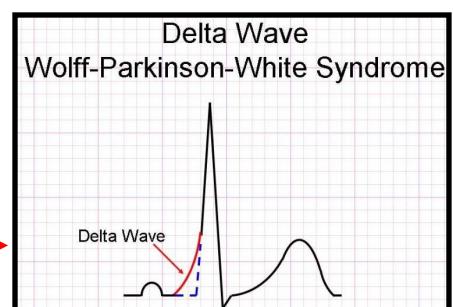
- Obtain 12 and 15 lead ECGs and leave cables connected

## STABLE (AAOX4 WITH OR WITHOUT HYPOTENSION)

- VAGAL MANEUVERS**
- ADENOSINE:**
  - 12mg rapid IV/IO, with a simultaneous 20mL **NORMAL SALINE** flush
  - Print ECG during administration
  - Contraindication:**
    - Heart Transplant
    - Patients taking Tegretol (Carbamazepine)
    - Patients with a history of second or third degree AV block (except in patients with a functioning artificial pacemaker)
    - Sick Sinus Syndrome without cardiac pacemaker in place
    - Active bronchospasm

## IF SVT FAILS TO CONVERT/ADENOSINE IS CONTRAINDICATED **OR** PATIENT HAS HISTORY OF ATRIAL DYSRHYTHMIAS

- CARDIZEM:**
  - 10mg IV/IO, over 2 minutes
  - If no response in 5 minutes, repeat with 15 mg IV/IO, over 2 minutes
  - Contraindication:**
    - Hypotension
    - Wide complex QRS
    - History of WPW or sick sinus syndrome
    - Heart Blocks
  - Precaution:**
    - Use with caution for patients taking beta blockers
    - May cause hypotension, see treatment on following page



# **Supraventricular Tachycardia** *continued...*



## CARDIZEM INDUCED HYPOTENSION

- **NORMAL SALINE:**
  - 1L IV/IO, titrate to desired effect. Assess lung sounds and BP frequently.
  - May repeat 1x prn
  - **Precautions** - Particular care must be taken in the presence of significant coronary heart disease, CHF, and renal failure patients
- **CALCIUM CHLORIDE:**
  - 500mg IV/IO, over 2 minutes

## UNSTABLE (ALTERED MENTAL STATUS WITH OR WITHOUT HYPOTENSION)

- **DO NOT DELAY CARDIOVERSION TO ESTABLISH IV ACCESS**
- **ETOMIDATE** (consider for sedation):
  - 6mg IV/IO
  - May repeat 1x prn
- **SYNCHRONIZED CARDIOVERSION:**
  - 100j, 200j, 300j, 360j
  - Repeat 360j until successfully converted
  - **Contraindication** - A-Fib or A-Flutter
  - **Precaution** - A brief trial of **ADENOSINE** can be used prior to cardioversion for a diagnostic tool if you suspect the underlying rhythm to be A-Fib or A-Flutter



## PEDIATRIC

- Obtain 12 and 15 lead ECGs and leave cables connected

## STABLE (AAOX4 WITH OR WITHOUT AGE APPROPRIATE HYPOTENSION)

- **VAGAL MANEUVERS**
- **ADENOSINE:**
  - 0.2mg/kg rapid IV/IO, with a simultaneous 10mL **NORMAL SALINE** flush
  - Max single dose 12mg
  - If no change in 1 minute:
    - 0.2mg/kg rapid IV/IO, with a simultaneous 10mL **NORMAL SALINE** flush
    - Max single dose 12mg
  - Print ECG during administration
  - **Contraindication** - (See adult)

## UNSTABLE (ALTERED MENTAL STATUS WITH OR WITHOUT AGE APPROPRIATE HYPOTENSION)

- **ETOMIDATE** (consider for sedation):
  - 0.1mg/kg IV/IO, over 30 seconds, max single dose 6mg
  - May repeat 1x prn, max total dose 12mg
- **SYNCHRONIZED CARDIOVERSION:**
  - 0.5j/kg
  - If not effective, increase to 2j/kg
  - Repeat 2j/kg until successfully converted
  - **Contraindication** - A-Fib or A-Flutter



# Wide Complex Tachycardia

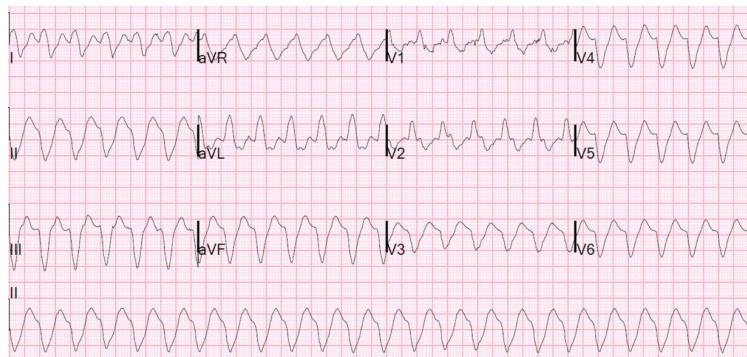


## INFORMATION

### ECG FEATURES THAT FAVOR A DIAGNOSIS OF VENTRICULAR TACHYCARDIA (V-TACH):

- V-TACH has no discernible P waves
- Precordial concordance: All chest leads point in the same direction (either positive OR negative)
- Negative Lead V6
- Backward frontal plane axis: II, III, and aVF are negative, aVL and aVR are positive
- Presence of capture beats or fusion beats (sinus beats that interrupt the WCT)
- Rate usually > 120 beats per minute
- QRS width > **0.12 (3 small boxes)**

## WCT



### ADULT

- Obtain 12 and 15 lead ECGs and leave cables connected

### STABLE WIDE COMPLEX TACHYCARDIA (WCT)

- AMIODARONE INFUSION:

- Dilute: 150mg of **AMIODARONE** in a 50mL bag of **NORMAL SALINE**
  - Administer over 10 minutes IV/IO by utilizing a 15 gtt set delivering 75 gtt/min (1.25 gtt/sec)
  - Administer all 150mg, even if the WCT terminates
  - May repeat 1x prn
- Contraindications:
  - Marked sinus bradycardia
  - Cardiogenic Shock
  - 2<sup>nd</sup> and 3<sup>rd</sup> Degree Heart Blocks
  - Hypotension
  - QTc > 500

Vent. rate	99 bpm
PR interval	* ms
QRS duration	92 ms
QT/QTc	414/531 ms
P-R-T axes	* 61 259

### UNSTABLE WCT (ANY AMIODARONE CONTRAINDICATION)

- **DO NOT** delay cardioversion to establish IV access
- **ETOMIDATE** (consider for sedation):
  - 6mg IV/IO
  - May repeat 1x prn
- **SYNCHRONIZED CARDIOVERSION**:
  - 100j, 200j, 300j, 360j
  - Repeat 360j until successfully converted
    - If a WCT converts with cardioversion and later returns to a WCT, use the last successful energy setting and increase as needed
  - Contraindications - WCTs that are **irregularly-irregular**

# Wide Complex Tachycardia *continued...*



## WCT PATIENT'S WHO CONVERT AFTER CARDIOVERSION

- Immediate 12 lead to rule out any **contraindications** to **AMIODARONE**
- **AMIODARONE INFUSION:** as noted on the previous page (if not already administered)
  - Only for patient's who convert after (any of the following):
    - 2 cardioversions by Fire Rescue
    - 2 or more shocks by their Implantable Cardioverter (ICD)
  - **DO NOT** administer Amiodarone if the patient has already received Amiodarone



## PEDIATRIC

- Pediatrics that have a QRS width **> 0.09 (2.25 boxes)**
- Obtain 12 and 15 lead ECGs and leave cables connected

## STABLE WIDE COMPLEX TACHYCARDIA

- **AMIODARONE INFUSION:**
  - **Dilute:** 5mg/kg of **AMIODARONE** in a 50 mL bag of **NORMAL SALINE**, max single dose 150mg
    - Administer over 25 minutes IV/IO by utilizing a 15 gtt set delivering 30 gtt/min (1 gtt/2 sec)
  - May repeat 1x prn
- **Contraindications:**
  - Marked sinus bradycardia
  - Cardiogenic Shock
  - 2<sup>nd</sup> and 3<sup>rd</sup> Degree Heart Blocks
  - Age appropriate hypotension
  - QTc > 500

Vent. rate	99 bpm
PR interval	* ms
QRS duration	92 ms
QT/QTc	414/531 ms
P-R-T axes	* 61 259

## UNSTABLE WCT (ANY AMIODARONE CONTRAINDICATION)

- **DO NOT** delay cardioversion to establish IV access
- **ETOMIDATE:**
  - 0.1mg/kg IV/IO, over 30 seconds, max single dose 6mg
  - May repeat 1x prn
- **SYNCHRONIZED CARDIOVERSION:**
  - 0.5j/kg
  - If no response, increase to 2j/kg
  - Repeat 2j/kg until successfully converted
    - If a WCT converts with cardioversion and later returns to a WCT, use the last successful energy setting and increase as needed
  - **Contraindications - WCTs that are irregularly-irregular**

## PATIENT'S WHO CONVERT AFTER CARDIOVERSION

- Immediate 12 lead to rule out any **contraindications** to **AMIODARONE**
- **AMIODARONE INFUSION:** as noted above (if not already administered)
  - Only for patient's who convert after (any of the following):
    - 2 cardioversions by Fire Rescue
    - 2 or more shocks by their Implantable Cardioverter (ICD)
  - **DO NOT** administer Amiodarone if the patient has already received Amiodarone

# **Regular Really Wide Complex Tachycardia**

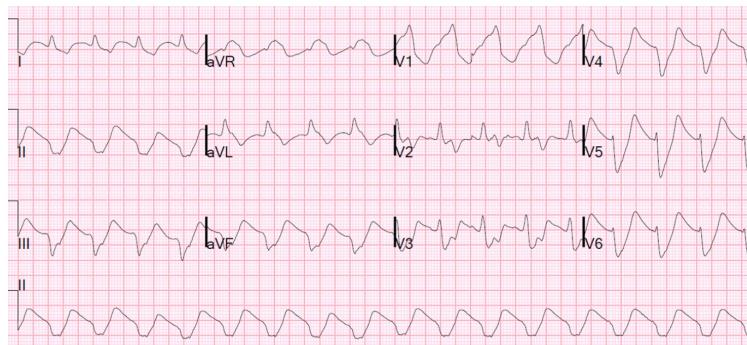


## INFORMATION

ECG FEATURES THAT FAVOR A DIAGNOSIS OF REGULAR REALLY WIDE COMPLEX TACHYCARDIA (RRWCT):

- RRWCT in adult and pediatric patients has a QRS width  $\geq 0.20$  (5 small boxes or 1 large box)
- Rate usually  $< 120$  beats per minute

## **RRWCT**



## ADULT

### STABLE REGULAR REALLY WIDE COMPLEX TACHYCARDIA (RRWCT)

- CALCIUM CHLORIDE:
  - 1g IV/IO, over 2 minutes
  - Precaution – **DO NOT** administer in same IV/IO line as SODIUM BICARBONATE without thoroughly flushing
- SODIUM BICARBONATE:
  - 100 mEq, IV/IO, over 2 minutes
  - Precaution – **DO NOT** administer in same IV /IO line as CALCIUM CHLORIDE without thoroughly flushing

### RRWCT WITH HYPOTENSION SHALL BE TREATED AS UNSTABLE

- **DO NOT** delay cardioversion to establish IV access
- ETOMIDATE (consider for sedation):
  - 6mg IV/IO
  - May repeat 1x prn
- SYNCHRONIZED CARDIOVERSION:
  - 100j, 200j, 300j, 360j
    - If a RRWCT converts with cardioversion and later returns to a WCT, use the last successful energy setting and increase as needed
  - Contraindications - WCTs that are **irregularly-irregular**

### IF UNSTABLE RRWCT FAILS TO CONVERT AFTER CARDIOVERSION OF 360J

- CALCIUM CHLORIDE: as noted above
- SODIUM BICARBONATE: as noted above
- SYNCHRONIZED CARDIOVERSION:
  - 360j every 2 minutes prn

# **Regular Really Wide Complex Tachycardia**



## **PEDIATRIC**

### **STABLE REGULAR REALLY WIDE COMPLEX TACHYCARDIA**

- CALCIUM CHLORIDE:
  - 20mg/kg IV/IO, over 2 minutes
  - Precaution – **DO NOT** administer in same IV/IO line as SODIUM BICARBONATE without thoroughly flushing
- SODIUM BICARBONATE:
  - 1mEq/kg IV/IO, over 2 minutes, max single dose 50mEq
  - May repeat 1x prn, in 5 minutes. Max total dose 100mEq
  - Precaution – **DO NOT** administer in same IV/IO line as CALCIUM CHLORIDE without thoroughly flushing

### **UNSTABLE REGULAR REALLY WIDE COMPLEX TACHYCARDIA (AGE APPROPRIATE HYPOTENSION)**

- **DO NOT** delay cardioversion to establish IV access
- ETOMIDATE:
  - 0.1mg/kg IV/IO, over 30 seconds, max single dose 6mg
  - May repeat 1x prn
- SYNCHRONIZED CARDIOVERSION:
  - 0.5j/kg
  - If no response, increase to 2j/kg
    - If a WCT converts with cardioversion and later returns to a WCT, use the last successful energy setting and increase as needed
  - Contraindications - WCTs that are **irregularly-irregular**

### **IF UNSTABLE RRWCT FAILS TO CONVERT AFTER CARDIOVERSION**

- CALCIUM CHLORIDE: as noted above
- SODIUM BICARBONATE: as noted above
- SYNCHRONIZED CARDIOVERSION:
  - 2j/kg every 2 minutes prn

# **Polymorphic V-Tach/ Torsades de Pointes**



## **INFORMATION**

- Torsades de Pointes is an uncommon form of V-Tach characterized by a changing in amplitude or “twisting” of the QRS complexes.
- Risk factors for Torsades:
  - Congenital long QT syndrome
  - Female gender
  - Renal/Liver failure
  - Medications that cause QT interval prolongation (e.g., anti-dysrhythmics, calcium channel blockers, psychiatric drugs, antihistamines)



## **ADULT**

- Obtain 12 and 15 lead ECGs and leave cables connected

### **STABLE POLYMORPHIC V-TACH**

- **MAGNESIUM SULFATE:**
  - **Dilute:** 2g of Magnesium Sulfate in a 50mL bag of **NORMAL SALINE**
    - Administer IV/IO utilizing a 60 gtt set, run wide open
  - **Contraindication – 2<sup>nd</sup> and 3<sup>rd</sup> Degree Heart Blocks**
  - **Precaution - Rapid infusion may cause hypotension**

### **UNSTABLE POLYMORPHIC V-TACH (HYPOTENSION)**

- **DO NOT** delay defibrillation to establish IV access
- **ETOMIDATE** (consider for sedation):
  - 6mg IV/IO
  - May repeat 1x prn
- **DEFIBRILLATION:**
  - 200j, 300j, 360j
    - If a PVT converts with defibrillation and later returns to a PVT, use the last successful energy setting and increase as needed

### **IF UNSTABLE POLYMORPHIC V-TACH CONVERTS AFTER DEFIBRILLATION AND MAGNESIUM SULFATE HAS NOT ALREADY BEEN ADMINISTERED**

- **MAGNESIUM SULFATE:**
  - **Dilute:** 2g of Magnesium Sulfate in a 50mL bag of **NORMAL SALINE**
    - Administer over 10 minutes IV/IO by utilizing a 15 gtt set delivering 75 gtt/min (1.25 gtt/sec)
  - **Contraindication – 2<sup>nd</sup> and 3<sup>rd</sup> Degree Heart Blocks**
  - **Precaution - Rapid infusion may cause hypotension**

## **Torsades**



# **Polymorphic V-Tach/ Torsades de Pointes**



## **PEDIATRIC**

- Obtain 12 and 15 lead ECGs and leave cables connected

## **STABLE POLYMORPHIC V-TACH**

- **MAGNESIUM SULFATE:**
  - **Dilute:** 40mg/kg in a 50mL bag of **NORMAL SALINE**
    - Administer over 10 minutes IV/IO by utilizing a 15 gtt set delivering 75gtts/min (1.25gtts/sec)
  - Max dose 2g
  - **Contraindication – 2<sup>nd</sup> and 3<sup>rd</sup> Degree Heart Blocks**
  - **Precaution - Rapid infusion may cause hypotension**

## **UNSTABLE POLYMORPHIC V-TACH (AGE APPROPRIATE HYPOTENSION)**

- **DO NOT** delay defibrillation to establish IV access
- **ETOMIDATE** (consider for sedation):
  - 0.1mg/kg IV/IO, over 30 seconds, max single dose 6mg
  - May repeat 1x prn
- **DEFIBRILLATION:**
  - 2j/kg, 4j/kg
    - If a PVT converts with defibrillation and later returns to a PVT, use the last successful energy setting and increase as needed

## **IF UNSTABLE POLYMORPHIC V-TACH CONVERTS AFTER DEFIBRILLATION AND MAGNESIUM SULFATE HAS NOT ALREADY BEEN ADMINISTERED**

- **MAGNESIUM SULFATE:**
  - **Dilute:** 40mg/kg in a 50mL bag of **NORMAL SALINE**
    - Administer over 10 minutes IV/IO by utilizing a 15 gtt set delivering 75gtts/min (1.25gtts/sec)
    - Max dose 2g
  - **Contraindication – 2<sup>nd</sup> and 3<sup>rd</sup> Degree Heart Blocks**
  - **Precaution - Rapid infusion may cause hypotension**

# **Left Ventricular Assist Devices - LVADs**



## **INFORMATION**

- Left Ventricular Assist Devices (LVADs), also known as Heart Pumps, are surgically implanted circulatory support devices designed to assist the pumping action of the heart.



## **ADULT**

- Every effort should be made to contact the patient's primary caretaker (spouse, guardian etc.) and the LVAD coordinator immediately
  - The phone number for LVAD coordinator will be on the device and the equipment carrying bag
  - If needed, assist patient (caretaker) in replacing the device's batteries or cables.
- Locate patient's emergency "bag" with backup equipment
- Take all equipment associated with the LVAD system to the ED
- Treat Non-LVAD associated conditions in accordance with the appropriate protocol
- **AUSCULTATE:**
  - Determine the type of device, assess alarms, auscultate for pump sounds
  - Patients with a properly functioning LVAD may NOT have a detectable pulse, measurable blood pressure or accurate oxygen saturation
  - Auscultate chest and upper abdominal quadrants. **Continuous humming sound = pump is working.**
- Locate the driveline site on the patient's abdomen
  - **DO NOT** cause any trauma to the driveline site or wires
  - If there is bleeding at the driveline site, apply direct pressure

## **HYPOTENSIVE**

- **NORMAL SALINE:**
  - 1L IV/IO, titrate to desired effect. Assess lung sounds and BP frequently.
  - May repeat 1x, prn
  - **Precautions** - Particular care must be taken in the presence of significant coronary heart disease, CHF, and renal failure patients

## **UNRESPONSIVE PATIENTS**

- **ONLY** perform chest compressions when the patient's LVAD is not working and no other options exist to restart the LVAD
- Evaluate unresponsive patients carefully for reversible causes by assessing:
  - A.E.I.O.U.-T.I.P.S.
  - H's & T's
- **CHECK BGL**
- **CHEST COMPRESSIONS:**
  - Position hands to the right of the sternum to avoid LVAD dislodgement
  - **Contraindication:**
    - **DO NOT** use the LUCAS Compression Device
  - **Precaution** - Performing Chest Compressions risks rupturing of the ventricular wall leading to fatal hemorrhage

# **Left Ventricular Assist Devices - LVADs**



## **TRANSPORT**

- Non-LVAD chief complaints should be transported according to the "Transport Destinations" protocol
  - If there are any questions regarding this, contact the EMS Captain and LVAD Coordinator
- **JFK MEDICAL CENTER LVAD COORDINATOR:**
  - (561) 548-5823. Any LVAD issue should be transported to JFK Medical Center

### **WARNING**

Be aware of the cables, controller, and batteries when preparing for transport. It may be best to place the stretcher straps under the LVAD cables so you are not creating any torque on the device.



# CARDIAC ARREST

*Standing Orders (p. 68)*

*Adult Cardiac Arrest (p. 70)*

*Adult Post Resuscitation (p. 71)*

*Pediatric Cardiac Arrest (p. 73)*

*Pediatric Post Resuscitation (p. 74)*

*Special Considerations (p. 75)*





# Standing Orders



## INFORMATION

- There is no scientific basis in trying to resuscitate an unwitnessed Asystolic patient who has succumbed to the dying process of a terminal illness. Consideration should be given to not starting resuscitation efforts in these cases.
- All witnessed cardiac arrest patients must be transported.
  - **Exception:** Hospice/DNR patients
- In general, when the scene is safe, all Cardiac Arrests should be worked on scene.



## ADULT & PEDIATRIC



### DETERMINATION OF DEATH

- The Paramedic may determine that the patient is dead/non-salvageable and decide not to resuscitate if:
  - **At least 1** of the following conditions is present:
    - Lividity
    - Rigor mortis
    - Tissue decomposition
    - A valid DNRO is presented or discovered
- **OR**
- If **all** of the following are present:
  - Known down time > 30 minutes
  - Asystole
  - Pupils fixed and dilated
  - Apneic
  - Without hypothermic mechanism for arrest

### PRIMARY VS. SECONDARY CARDIAC ARREST

- Determine if **Primary** or **Secondary** cardiac arrest and refer to the age appropriate “Cardiac Arrest” algorithm (pg. 70/73)

#### Primary Arrest:

- AMI
- Cardiac arrhythmias
- Cocaine Overdose
- Electrocution (Alternating Current)
- Unknown Origin

#### Secondary Arrest:

- **ALL PEDIATRICS**
- Hypoxia (e.g., Narcotic OD, FBAO, Hanging)
- Drowning
- CHF
- Lightning Strike (Direct Current)
- Trauma
- Cyanide Exposure
- Third Trimester Pregnancy

### MICCR – MINIMALLY INTERRUPTED CARDIO-CEREBRAL RESUSCITATION

- Emphasis is placed on minimizing interruptions in compressions to no more than 5 seconds
- Perform all assignments in Pit Crew fashion and make all efforts to obtain a ROSC prior to leaving the scene
- Once available, apply the LUCAS Compression Device with minimal interruptions to chest compressions and set to continuous compressions if applicable. Patient should be placed on the scoop stretcher for transport purposes
- When possible elevate the patients head 15° or utilize Head-Up CPR Device if available
- **DO NOT** turn off the LUCAS Compression Device for defibrillations, or advanced airway procedures

# **Standing Orders** *continued...*



## **ADULT & PEDIATRIC (continued)**



### **MEDICATIONS**

- Medications should be delivered as soon as possible after the rhythm check (during compressions) and circulated for 2 minutes
- Follow all IVP medication administrations with:
  - **NORMAL SALINE:**
    - 10 mL flush
- Search for possible causes and treat accordingly (i.e., H's & T's, BGL, etc.)

### **RESQPOD**

- ResQPOD should be used for all cardiac arrest patients
  - **Contraindications:**
    - Patient is < 1 year old
    - Traumatic arrest
    - Patient has a pulse
    - During passive oxygenation

### **TERMINATION OF EFFORTS (ADULT ONLY)**

- Consider terminating efforts when an EMS Captain is on scene and:
  - "Persistent Asystole" for 15 minutes
  - EtCO<sub>2</sub> of < 10 mm Hg
  - Patient is normothermic
  - **NORMAL SALINE:**
    - 500 mL has been administered
  - **1 DEFIBRILLATION**
    - 360 joules (can be performed at any time during the arrest)
  - All reversible causes have been addressed
  - All ALS interventions have been completed
  - Social support group is in place for the family if needed.

#### **H's**

- |   |   |
|---|---|
| <ul style="list-style-type: none"><li>• Hydrogen Ion (Acidosis):</li><li>• Hyperkalemia (Renal Failure):</li><li>• Hypoglycemia:</li><li>• Hypoxia:</li><li>• Hypovolemia:</li><li>• Hypothermia:</li></ul> | <ul style="list-style-type: none"><li><b>Ventilation</b></li><li><b>Calcium Chloride, Sodium Bicarb, Albuterol</b></li><li><b>Glucose</b></li><li><b>Oxygen &amp; Ventilate</b></li><li><b>Fluid Bolus</b></li><li><b>Warming</b></li></ul> |
|---|---|

#### **T's**

- |   |   |
|---|---|
| <ul style="list-style-type: none"><li>• Toxins or Tablets (OD):</li><li>• Tension Pneumothorax:</li></ul> | <ul style="list-style-type: none"><li><b>Opiates (Narcan)</b></li><li><b>Tricyclic Antidepressants (Sodium Bicarb)</b></li><li><b>Calcium Channel Blocker (Calcium Chloride)</b></li><li><b>Bilateral Pleural Decompression</b></li></ul> |
|---|---|

# Adult Cardiac Arrest

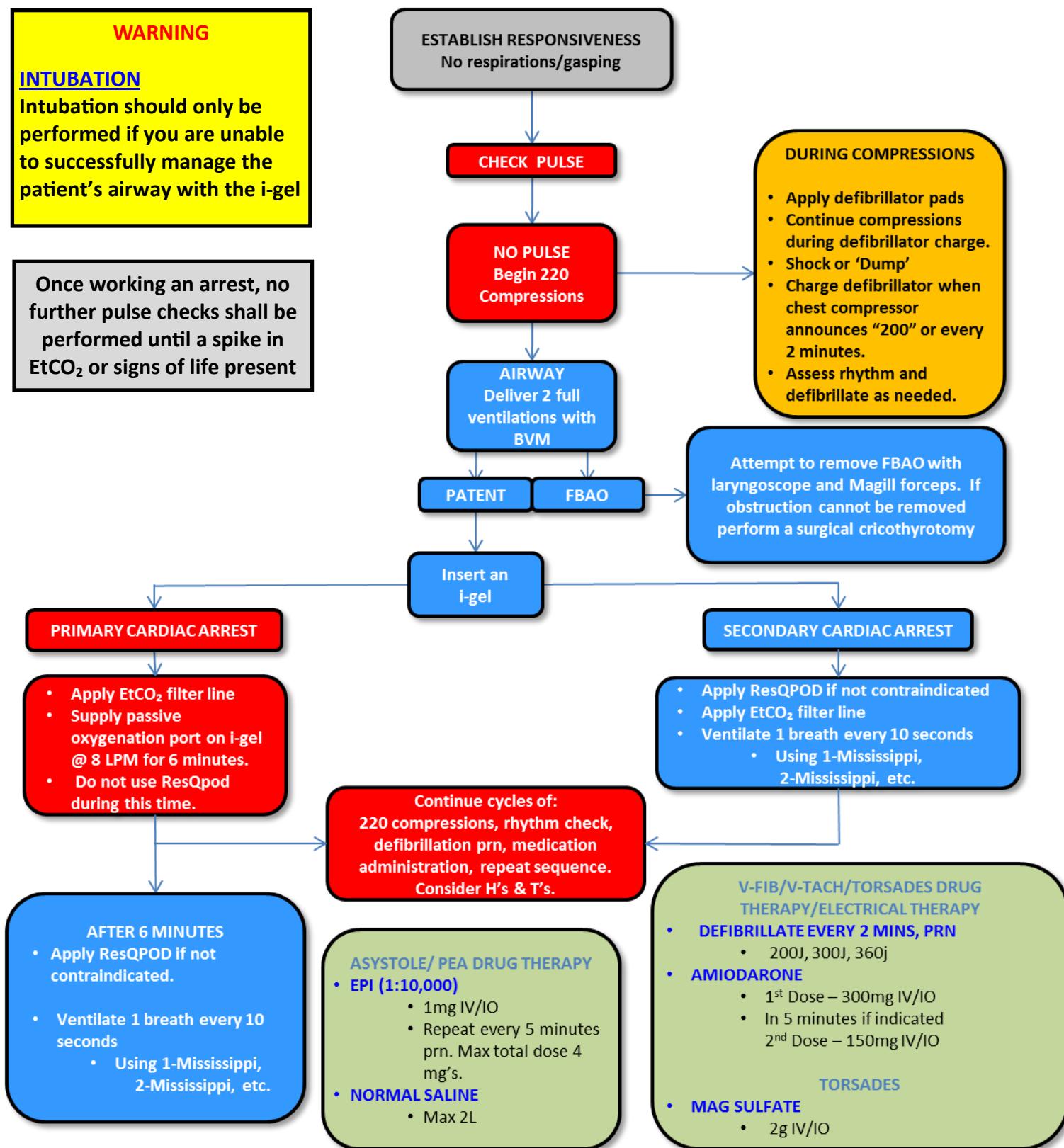


## WARNING

### INTUBATION

Intubation should only be performed if you are unable to successfully manage the patient's airway with the i-gel

Once working an arrest, no further pulse checks shall be performed until a spike in EtCO<sub>2</sub> or signs of life present



# Adult Post Resuscitation



## POST ARREST

- Patients with a ROSC should be managed in the following order:
  - Remove ResQPOD from the ETT or i-gel
  - Obtain 12 and 15 lead ECGs and leave cables connected
  - RATE:
    - **UNSTABLE BRADYCARDIA (HYPOTENSIVE)**
      - **TRANSCUTANEOUS PACING:**
        - Initial rate of **60** beats per minute and increase millamps until capture is gained
        - Increase the rate as needed until the patient is hemodynamically stable
  - RHYTHM:
    - Reference specific protocol
  - **BLOOD PRESSURE:** (Goal is to maintain a SBP of 100 mm Hg)
    - **NORMAL SALINE:**
      - 1L IV/IO, titrate to desired effect. Assess lung sounds and BP frequently.
      - May repeat 1x, prn
      - **Precautions - Particular care must be taken in the presence of significant coronary heart disease, CHF, and renal failure patients**
    - If patient remains hypotensive:
    - **PUSH-DOSE PRESSOR EPINEPHRINE (1:100,000):**
      - **Dilute:** Discard 9 mL of Epi 1:10,000 (0.1mg/mL) and draw up 9 mL of **NORMAL SALINE** to create Push-Dose Pressor Epi 1:100,000. This will yield 10mcg/mL.
        - Administer 1 mL/minute IV/IO, titrate to maintain SBP 100mm Hg
      - May repeat 2x prn, max total dose 300mcg (30 mL)
      - **Contraindications - Hypotension secondary to blood loss**
      - **Precautions:**
        - Rapid (1 minute) onset, short (5-10 minute) duration
        - Monitor heart rate and blood pressure throughout administration
    - Apply **ICE PACKS** to the axilla and groin for patients who remain unresponsive
      - **Contraindication– Trauma**



## POST V-FIB/V-TACH CONSIDERATIONS IF NO IVP AMIODARONE WAS ADMINISTERED AND 2 SHOCKS HAVE BEEN DELIVERED

- **AMIODARONE INFUSION:**

- **Dilute:** 150mg of **AMIODARONE** in a 50mL bag of **NORMAL SALINE**
  - Administer over 10 minutes IV/IO by utilizing a 15 gtt set delivering 75 gtt/min (1.25 gtt/sec)
  - Administer all 150mg, even if the WCT terminates
  - May repeat 1x prn
- **Contraindications:**
  - Marked sinus bradycardia
  - Cardiogenic Shock
  - 2<sup>nd</sup> and 3<sup>rd</sup> Degree Heart Blocks
  - Hypotension
  - QTc > 500

Vent. rate	99 bpm
PR interval	* ms
QRS duration	92 ms
QT QTc	414/531 ms
P-R-T axes	* 61 259

## POST TORSADES CONSIDERATIONS IF MAGNESIUM SULFATE HAS NOT ALREADY BEEN ADMINISTERED

- **MAGNESIUM SULFATE:**

- **Dilute:** 2g of Magnesium Sulfate in a 50mL bag of **NORMAL SALINE**
  - Administer over 10 minutes IV/IO by utilizing a 15 gtt set delivering 75 gtt/min (1.25 gtt/sec)
- **Contraindication – 2<sup>nd</sup> and 3<sup>rd</sup> Degree Heart Blocks**
- **Precaution - Rapid infusion may cause hypotension**

## Torsades



# Cardiac Arrest (Pediatric)



## WARNING

### INTUBATION

Intubation should only be performed if you are unable to successfully manage the patient's airway with the i-gel

Once working an arrest, no further pulse checks shall be performed until a spike in EtCO<sub>2</sub> or signs of life present

ESTABLISH RESPONSIVENESS  
No respirations/gasping

CHECK PULSE

NO PULSE  
Begin 220 Compressions

AIRWAY  
Deliver 2 full ventilations with BVM

PATENT

FBAO

### DURING COMPRESSIONS

- Turn on metronome
- Apply defibrillator pads
- Continue compressions during defibrillator charge.
- Shock or 'Dump'
- Charge defibrillator when chest compressor announces "200" or every 2 minutes
- Assess rhythm and defibrillate as needed.

Attempt to remove FBAO with laryngoscope and Magill forceps.  
If obstruction cannot be removed perform a needle cricothyrotomy

Insert an i-gel

- Apply ResQpod if not contraindicated
- Apply EtCO<sub>2</sub> filter line
- Ventilate at a rate of 1 breath every 6 seconds
- Utilize the metronome or ResQPOD blinking light to synchronize ventilations

Continue cycles of:  
220 compressions, rhythm check, defibrillation prn, medication administration, repeat sequence.  
Consider H's & T's.

### ASYSTOLE/ PEA DRUG THERAPY

- EPI (1:10,000)**
  - 0.01mg/kg IV/IO
  - May repeat 4x every 5 minutes prn
- NORMAL SALINE**
  - 20 mL/kg IV/IO
  - May repeat 2x, prn

### V-FIB/V-TACH DRUG THERAPY/ELECTRICAL THERAPY

#### DEFIBRILLATE EVERY 2 MINS, PRN

- 2j/kg – subsequent energy levels are
- 4j/kg. Increase to 10j/kg if unable to convert V-FIB/V-TACH/TORSADES

#### AMIODARONE

- 5mg/kg every 5 minutes. Max single dose 300mg.
- May repeat 2x.

#### TORSADES

#### MAG SULFATE

- 40mg/kg IV/IO

# Pediatric Post Resuscitation



## PEDIATRIC

### POST ARREST

- Patients with a ROSC should be managed in the following order:
  - Remove ResQPOD from the ETT or i-gel
  - Obtain 12 and 15 lead ECGs and leave cables connected
  - RATE: Reference specific protocol
  - RHYTHM: Reference specific protocol
  - BLOOD PRESSURE: (Refer to the “Handtevy” system)
    - NORMAL SALINE:
      - 20mL/kg IV/IO. Assess lung sounds and BP frequently
      - May repeat 2x prn, for age appropriate hypotension
    - If patient remains hypotensive:
    - PUSH-DOSE PRESSOR EPINEPHRINE (1:100,000):
      - Dilute: Discard 9 mL of Epi 1:10,000 (0.1mg/mL) and draw up 9 mL of NORMAL SALINE to create Push-Dose Pressor Epi 1:100,000. This will yield 10mcg/mL.
        - Administer 1 mL/minute IV/IO, titrate to maintain age appropriate SBP
      - May repeat 2x prn, max total dose 300mcg (30 mL)
      - Contraindications - Hypotension secondary to blood loss
      - Precaution:
        - DO NOT administer faster than 1mL/minute
        - Push-Dose Pressor Epinephrine has a rapid (1 minute) onset, short (5-10 minute) duration
        - Monitor heart rate and blood pressure throughout administration
    - Apply ICE PACKS to the axilla and groin for patients who remain unresponsive
      - Contraindication– Trauma

### POST V-FIB/V-TACH CONSIDERATIONS IF NO IVP AMIODARONE WAS ADMINISTERED AND 2 SHOCKS HAVE BEEN DELIVERED

- AMIODARONE INFUSION:
  - Dilute: 5mg/kg of AMIODARONE in a 50 mL bag of NORMAL SALINE, max single dose 150mg
    - Administer over 25 minutes IV/IO by utilizing a 15gtt set delivering 30 gtt/min (1gtt/2sec)
  - May repeat 1x prn
  - Contraindications:
    - Marked sinus bradycardia
    - Cardiogenic Shock
    - 2<sup>nd</sup> and 3<sup>rd</sup> Degree Heart Blocks
    - Age appropriate hypotension
    - QTc > 500

Vent. rate	99 bpm
PR interval	* ms
QRS duration	92 ms
QT QTc	414/531 ms
P-R-T axes	* 61 259

### POST TORSADES CONSIDERATIONS IF MAGNESIUM SULFATE HAS NOT ALREADY BEEN ADMINISTERED

- MAGNESIUM SULFATE:
  - Dilute: 40mg/kg in a 50mL bag of NORMAL SALINE
    - Administer over 10 minutes IV/IO by utilizing a 15gtt set delivering 75gtts/min (1.25gtt/sec)
  - Max dose 2g
  - Contraindication - 2<sup>nd</sup> and 3<sup>rd</sup> Degree Heart Blocks
  - Precaution - Rapid infusion may cause hypotension



# Special Considerations



## INFORMATION

- The below treatments are in addition to standard therapy.



## ADULT

### HYPERKALEMIA

- CALCIUM CHLORIDE:**
  - 1g IV/IO
  - Precaution – **DO NOT** administer in same IV/IO line as **SODIUM BICARBONATE** without thoroughly flushing
- ALBUTEROL:**
  - 2.5mg via nebulizer
    - Continuous treatments (if an advanced airway is utilized, administer via in-line nebulization)
- SODIUM BICARBONATE:**
  - 100 mEq IV/IO
  - Precaution – **DO NOT** administer in same IV/IO line as **CALCIUM CHLORIDE** without thoroughly flushing

### EXCITED DELIRIUM

- SODIUM BICARBONATE:**
  - 100 mEq IV/IO
- COLD NORMAL SALINE (if available):**
  - 1L IV/IO, titrate to desired effect. Assess lung sounds and BP frequently.
  - May repeat 1x, prn
  - Precautions - Particular care must be taken in the presence of significant coronary heart disease, CHF, and renal failure patients

### THIRD TRIMESTER

- Manually displace the uterus to the left
- All third trimester patients in cardiac arrest should be treated as if they are in **SECONDARY ARREST**
- Transport to the closest OB hospital
  - Exception:** Trauma alerts



### DRUG OVERDOSE

- Treat all drug overdoses as a **SECONDARY ARREST**
  - Exception:** Cocaine overdose
- Treat Cocaine overdoses as a **PRIMARY ARREST**

# ***Special Considerations*** *Continued...*



**ADULT**

## **CPR INDUCED CONSCIOUSNESS**

- Defined as patients without a spontaneous heartbeat who gain consciousness while receiving CPR
- **KETAMINE:**
  - **Dilute:** 200mg of Ketamine in a 50mL bag of **NORMAL SALINE**
    - Administer IV/IO utilizing a 60 gtt set, run wide open
  - May repeat 1x prn
  - **Contraindications:**
    - Pregnant patients
    - Penetrating eye injury
    - Non-traumatic chest pain

## **HYPOGLYCEMIA**

- **D10:**
  - 250mL IV/IO, rapid infusion

## **REFRACTORY V-FIB/V-TACH**

- Defined as persistent V-Fib/V-Tach with no transient interruption of V-Fib/V-Tach after 5 defibrillations
- If **ALL 3** of the below treatments have failed to convert the refractory V-Fib/V-Tach:
  - 5 or more standard defibrillations have been delivered
  - Correctable causes (i.e., H's & T's) have been addressed
  - 450mg of **AMIODARONE** has been administered
- **DOUBLE SEQUENTIAL DEFIBRILLATION:**
  - Apply an additional set of external defibrillations pads anterior/lateral **OR** anterior/posterior depending on where the initial pads were placed
  - Verify both monitors/defibrillators are attached and confirm V-Fib/V-Tach rhythm on both monitors
  - Charge both monitors to the maximum energy setting and ensure all team members are clear of the patient
  - Defibrillate by pressing both shock buttons as synchronously as possible
  - Repeat every 2 minutes until termination of Refractory V-Fib/V-Tach
- **ESMOLOL:**
  - 40mg IV/IO over 1 minute
- **ESMOLOL INFUSION (IF REFRACTORY V-FIB/V-TACH IS STILL PRESENT):**
  - **Dilute:** 60mg of **ESMOLOL** in a 50mL bag of **NORMAL SALINE**
  - Administer over 10 minutes IV/IO by utilizing a 15 gtt set delivering 75 gtt/min (1.25 gtt/sec)



# **Special Considerations** *Continued...*



## ADULT & PEDIATRIC



### ELECTROCUTION (ALTERNATING CURRENT)

- Treat as a **PRIMARY ARREST**
- Immediate **DEFIBRILLATION** as applicable
- Consider Spinal Motion Restriction
- Transport patient as a Trauma Alert

### LIGHTNING STRIKE (DIRECT CURRENT)

- Treat as a **SECONDARY ARREST**
- Immediate **DEFIBRILLATION** as applicable
- Consider Spinal Motion Restriction
- Transport patient as a Trauma Alert

### CYANIDE EXPOSURE

- Treat as a **SECONDARY ARREST**
- Any firefighter who suffers cardiac arrest during or within 6 hours after a fire incident, shall be treated for a Cyanide Exposure
- Refer to the "Cyanide Exposure" protocol (pg. 100), for Cyanokit dosing

### HANGING

- Treat as a **SECONDARY ARREST**
- Consider spinal motion restriction
- Transport to closest facility

### DROWNING

- Treat as a **SECONDARY ARREST**
- No drowning victim is to be pronounced dead at the scene if the possibility of hypothermia exists
- Remove patient's wet clothes, dry, and cover with blankets

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# ***Overdose Emergencies***

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***Standing Orders (p. 80)***

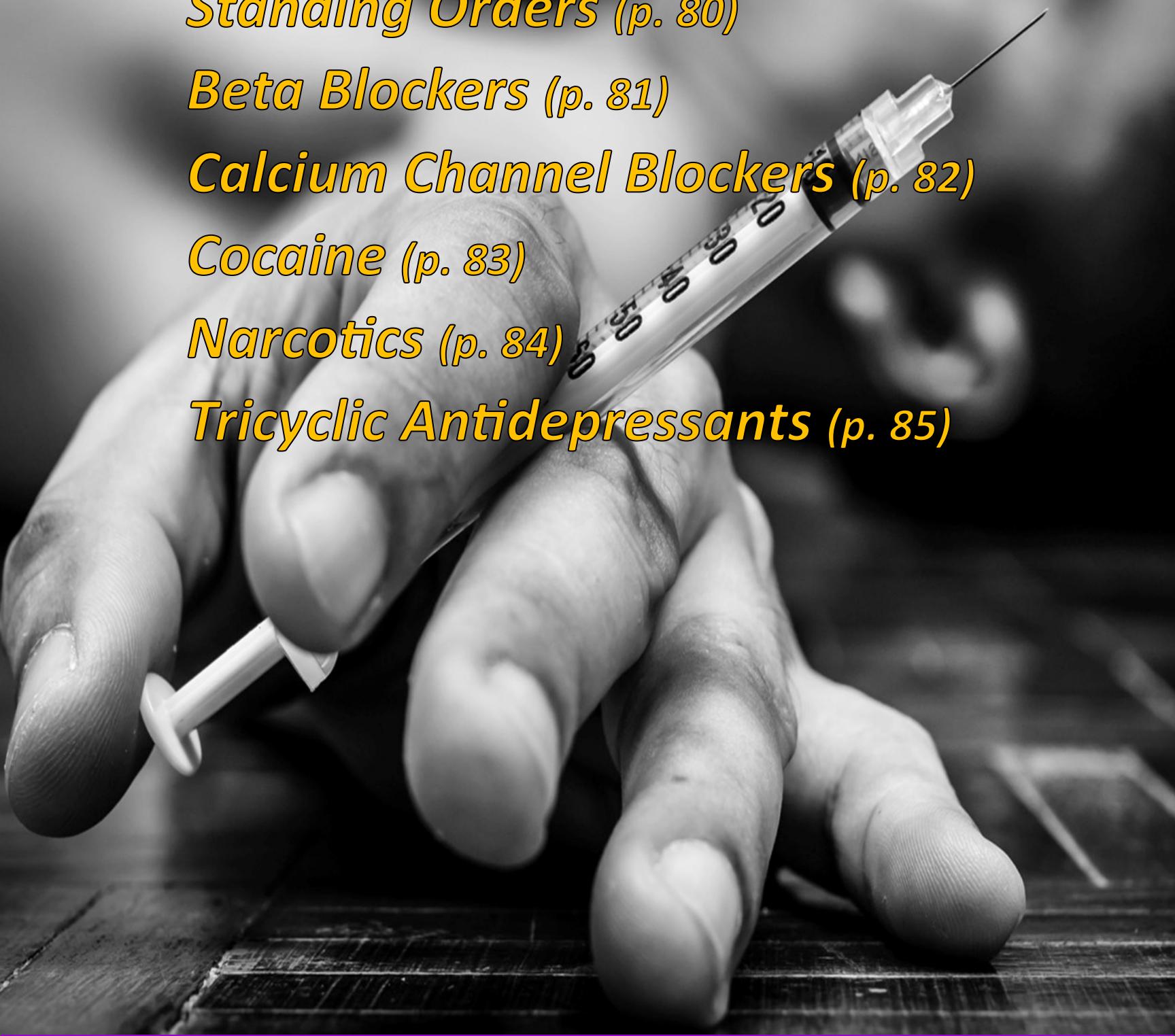
***Beta Blockers (p. 81)***

***Calcium Channel Blockers (p. 82)***

***Cocaine (p. 83)***

***Narcotics (p. 84)***

***Tricyclic Antidepressants (p. 85)***





# Standing Orders



## INFORMATION

- The goal for effectively managing patients with an overdose/poisoning is to:
  - Support the ABCs
  - Terminate seizures
  - Terminate any lethal cardiac arrhythmias
  - Reverse the toxic effects of the poison/medication with a specific antidote
- The treating paramedic should consider contacting the **Florida Poison Control Center** at **1-800-222-1222** as soon as possible for additional treatment recommendations.
  - Treatment recommendations from **Florida Poison Control** should be followed.
  - Document the directed treatment and the name of the representative on the ePCR Report.

## **WARNING**

- Use caution when supporting blood pressure with fluids. Many medications depress myocardial contractility and heart rate, which predispose the patient to heart failure even with boluses as little as 500mL.
- It may be necessary to limit the amount of fluids the patient receives. Assess lung sounds and BP frequently.

# Beta Blocker Overdose



## INFORMATION

- **Signs & Symptoms:**
  - Bradycardia
  - Hypotension
  - Cardiac arrhythmias
  - Hypothermia
  - Hypoglycemia
  - Seizures
- Follow the appropriate protocol if patient is symptomatic and treatment is not listed below.

### Common Beta Blockers:

- Atenolol
- Carvedilol
- Metoprolol
- Propranolol



## ADULT

- Obtain 12 and 15 lead ECGs and leave cables connected

### ISOLATED HYPOTENSION

- **NORMAL SALINE:**
  - 1L IV/IO, titrate to desired effect. Assess lung sounds and BP frequently.
  - May repeat 1x prn
  - **Precautions - Particular care must be taken in the presence of significant coronary heart disease, CHF, and renal failure patients**
- Refer to the "Bradycardia" protocol (pg. 50), if applicable



## PEDIATRIC

- Obtain 12 and 15 lead ECGs and leave cables connected

### ISOLATED HYPOTENSION

- **NORMAL SALINE:**
  - 20 mL/kg IV/IO. Assess lung sounds and BP frequently
  - May repeat 2x prn, for age appropriate hypotension
- Refer to the "Bradycardia" protocol (pg. 50), if applicable

# Calcium Channel Blocker Overdose



## INFORMATION

- **Signs & Symptoms:**
  - Hypotension
  - Syncope
  - Seizure
  - AMS
  - Non-Cardiogenic Pulmonary Edema
  - Bradycardia
- Follow the appropriate protocol if patient is symptomatic and treatment is not listed below.

### Common Calcium Channel Blockers:

- Norvasc
- Cardizem
- Cardene
- Procardia



## ADULT

- Obtain 12 and 15 lead ECGs and leave cables connected

### ISOLATED HYPOTENSION

- **CALCIUM CHLORIDE:**
  - 1g IV/IO, over 2 minutes
- **NORMAL SALINE:**
  - 1L IV/IO, titrate to desired effect. Assess lung sounds and BP frequently.
  - May repeat 1x, prn
  - **Precautions** - Particular care must be taken in the presence of significant coronary heart disease, CHF, and renal failure patients



### HYPOTENSION WITH BRADYCARDIA OR NON-RESPONSIVE TO ABOVE TREATMENT

- Refer to the "Bradycardia" protocol (pg. 50), if applicable

## PEDIATRIC

- Obtain 12 and 15 lead ECGs and leave cables connected

### ISOLATED HYPOTENSION

- **CALCIUM CHLORIDE:**
  - 20mg/kg IV/IO, over 2 minutes
  - May repeat every 10 minutes until symptoms resolve, max total dose 1g
- **NORMAL SALINE:**
  - 20 mL/kg IV/IO. Assess lung sounds and BP frequently.
  - May repeat 2x prn, for age appropriate hypotension

### HYPOTENSION WITH BRADYCARDIA OR NON-RESPONSIVE TO ABOVE TREATMENT

- Refer to the "Bradycardia" protocol (pg. 50), if applicable

# Cocaine Overdose



## INFORMATION

- **Signs & Symptoms:**
  - Tachycardia
  - Supraventricular and ventricular cardiac arrhythmias
  - Chest pain/STEMI
  - HTN
  - Seizures
  - Excited delirium
  - Hyperthermia
- Follow the appropriate protocol if patient is symptomatic and treatment is not listed below.



## ADULT

- Obtain 12 and 15 lead ECGs and leave cables connected

### PATIENTS PRESENTING WITH STABLE SVT, WCT, CHEST PAIN, HTN, OR SEIZURES

- **VERSED:**
  - 5mg IV/IO/IM
  - May repeat 1x prn, in 5 minutes
  - **Contraindication - Hypotension**
  - **Precaution - Monitor for respiratory depression**
- Follow appropriate protocol if:
  - Above treatment is unsuccessful  
**OR**
  - If the patient has an unstable cardiac arrhythmia



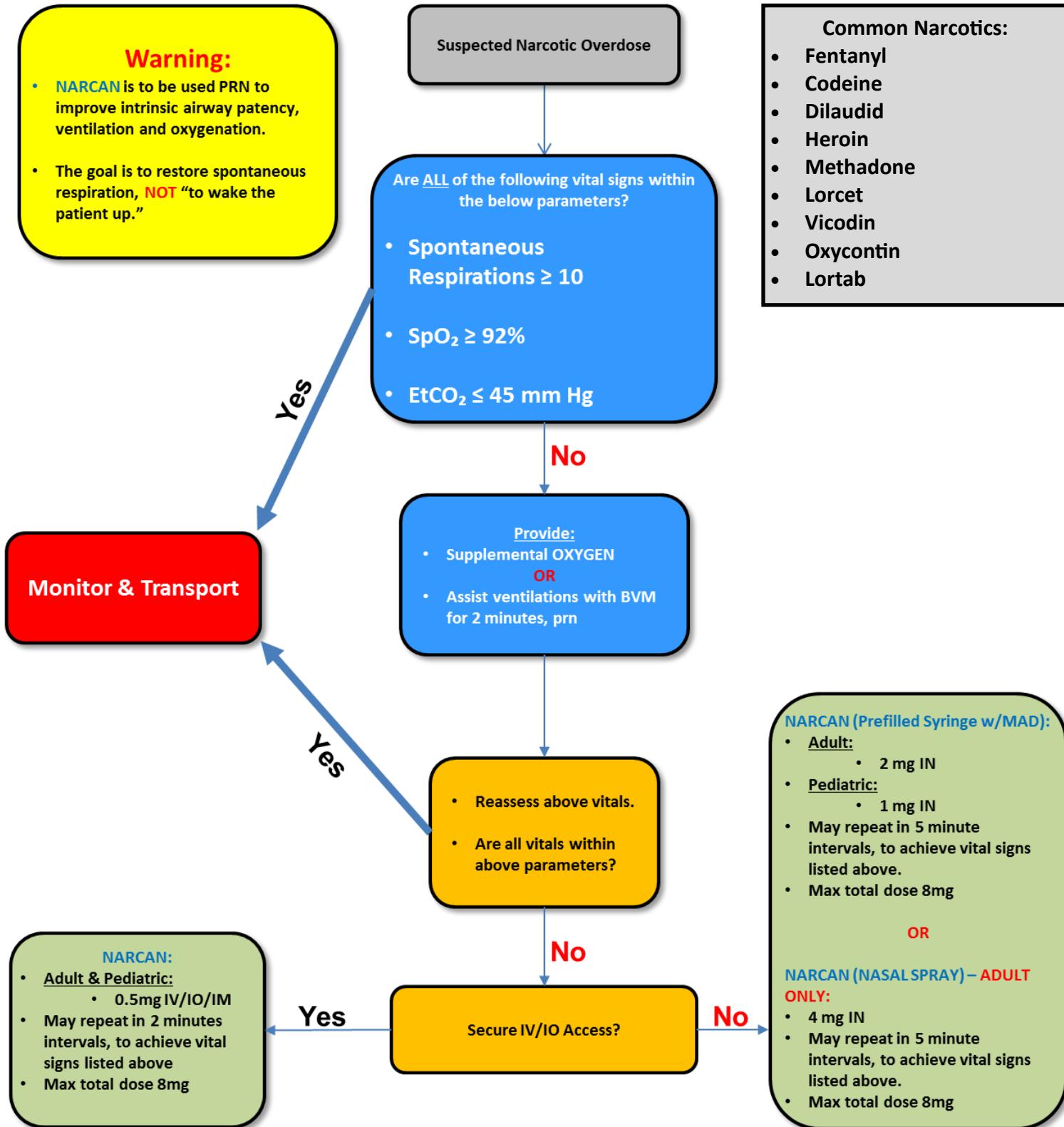
## PEDIATRIC

- Obtain 12 and 15 lead ECGs and leave cables connected

### PATIENTS PRESENTING WITH STABLE SVT, WCT, CHEST PAIN, HTN, OR SEIZURES

- **VERSED:**
  - 0.1 mg/kg IV/IO, max single dose 5mg
  - 0.2 mg/kg IN/IM, max single dose of 5mg
  - May repeat either route 1x prn
  - **Contraindication-Hypotension**
  - **Precaution - Monitor for respiratory depression**

# Narcotic Overdose



# Tricyclic Antidepressant (TCA) Overdose



## INFORMATION

### Signs & Symptoms:

- Mad as a hatter
- Red as a beet
- Hot as hell
- Dry as a bone
- Blind as a bat
- Coma
- Seizures
- Cardiac arrhythmia
- Acidosis

### Common TCA:

- Amitriptyline
- Desipramine
- Doxepin



## ADULT

- Obtain 12 and 15 lead ECGs and leave cables connected

### FOR PATIENT WITH A QRS COMPLEX > 0.10 SECONDS (2.5 SMALL BOXES)

#### SODIUM BICARBONATE:

- 100 mEq IV/IO, over 2 minutes
- If no change in 5 minutes:
  - 50 mEq IV/IO, over 2 minutes
- Max total dose 150 mEq
- **Precautions - Discontinue treatment when QRS complexes are < 0.10 seconds (2.5 small boxes)**

## ISOLATED HYPOTENSION

#### NORMAL SALINE:

- 1L IV/IO, titrate to desired effect. Assess lung sounds and BP frequently.
- May repeat 1x, prn
- **Precautions - Particular care must be taken in the presence of significant coronary heart disease, CHF, and renal failure patients**



## PEDIATRIC

- Obtain 12 and 15 lead ECGs and leave cables connected

### FOR PATIENT WITH A QRS COMPLEX > 0.08 SECONDS (2 SMALL BOXES)

#### SODIUM BICARBONATE 8.4%:

- 1mEq/kg IV/IO, over 2 minutes, max single dose 50 mEq
- May repeat 2x prn, in 5 minute intervals, max total dose 150 mEq
- **Precautions - Discontinue treatment when QRS complexes are < 0.08 seconds (2 small boxes)**

## ISOLATED HYPOTENSION

#### NORMAL SALINE:

- 20 mL/kg IV/IO. Assess lung sounds and BP frequently
- May repeat 2x prn, for age appropriate hypotension

## WARNING

TCAs cause death primarily through lethal cardiac arrhythmias. Wide QRS complexes are an ominous sign and must be treated with SODIUM BICARBONATE immediately.

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## ***Chemical Control***

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***Chemical Restraint (p. 88)***

***Pain Management (p. 90)***

***Adult Advanced Airway (p. 92)***

***≥ 36 months Advanced Airway (p. 93)***

***< 36 months Advanced Airway (p. 94)***



# Chemical Restraint



## INFORMATION

- Restrained patients shall **NOT** be placed in a prone position.
- Chemical restraint may be used in addition to physical restraint for the following:
- **VIOLENT/COMBATIVE PATIENTS** are agitated patients who place themselves and/or crew in danger
- **EXCITED DELIRIUM PATIENTS** have bizarre, aggressive behavior which may be associated with the use of cocaine (crack), PCP (angel dust), bath salts, Flakka, methamphetamines and amphetamines



## ADULT

- Law enforcement must first gain physical control of the patient

## FOR SPECIAL POPULATION VIOLENT/COMBATIVE/EXCITED DELIRIUM

- **Special population patients:**
  - Over 65 years old
  - Head trauma
  - < 50 kg
  - Already taken other sedatives (e.g., benzodiazepines, alcohol, etc.)
- **KETAMINE:**
  - 200mg IM for the above patients
  - May repeat 3x prn, in 5 minute intervals to gain control of the patient
  - **Contraindications:**
    - Pregnant patients
    - Penetrating eye injury
    - Non-traumatic chest pain
  - **Precautions:**
    - Be prepared for advanced airway management
    - Rapid IV administration is associated with respiratory depression, apnea, and higher than usual increases in blood pressures
    - May increase schizophrenic symptoms

## FOR ALL OTHER VIOLENT/COMBATIVE/EXCITED DELIRIUM

- **KETAMINE:**
  - 400mg IM
  - May repeat 1x prn, in 5 minutes
  - **Contraindications - as noted above**
  - **Precautions - as noted above**

## LARYNGOSPASM (STRIDOR) REACTION TO KETAMINE ADMINISTRATION

- High flow O<sub>2</sub>
- Assist ventilations via BVM prn
- Consider advanced airway procedures
- **Precaution - Laryngospasm is uncommon and is usually self-limiting. It almost always resolves with high flow O<sub>2</sub> or brief ventilation via BVM.**

# ***Chemical Restraint*** *continued....*



## **HYPERSALIVATION REACTION TO KETAMINE ADMINISTRATION**

- ATROPINE:
  - 0.5mg IV/IO
  - May repeat prn, in 3 minute intervals, max total dose 3mg
  - Contraindication - Bradycardia in the presence of an myocardial infarction

## **AFTER KETAMINE ADMINISTRATION**

- If patient begins to wake up:
  - VERSED:
    - 5mg IV/IO/IN/IM
    - May repeat 1x prn, in 5 minutes
    - Contraindication-Hypotension
    - Precaution-Monitor for respiratory depression
- Obtain a temperature.

## **RAPID COOLING FOR A TEMPERATURE OF > 103 DEGREES F**

- Apply ice packs to axilla and groin area
- COLD NORMAL SALINE: (if available)
  - 1L IV/IO. Titrate to desired effect. Assess lung sounds and BP frequently.
  - May repeat 1x, prn
  - Precautions - Particular care must be taken in the presence of significant coronary heart disease, CHF, and renal failure patients
- SODIUM BICARBONATE:
  - 100 mEq, IV/IO, over 2 minutes



# Pain Management



## INFORMATION

- **FENTANYL** is the front line medication for pain, however **KETAMINE** is preferred for hypotensive patients or patients who have opiate contraindications (allergy, history of abuse, etc.).
- **KETAMINE** may be given with or instead of **FENTANYL** for severe pain.
  - $\geq 7$  on the pain scale is considered “severe pain”



## ADULT

### FOR PAIN MANAGEMENT

- **FENTANYL:**
  - 100mcg IV/IO/IN/IM
  - May repeat 2x prn, in 5 minute intervals
    - **Contraindication - Pregnancy near term (32 weeks or greater) or in active labor**
    - **Precaution:**
      - History of opiate abuse or drug seeking behavior
      - Monitor patient for respiratory depression
      - Discontinue if patient becomes drowsy
      - Can be reversed with **NARCAN** if necessary

### FOR SEVERE PAIN MANAGEMENT (PAIN SCALE 7 OR HIGHER)

- **KETAMINE:**
  - **Dilute:** 25mg of Ketamine in a 50mL bag of **NORMAL SALINE**
    - Administer IV/IO utilizing a 60 gtt set, run wide open
    - Reassess pain scale after half of the infusion has been administered
      - Continue infusion if needed
      - May repeat 2x prn
  - **Contraindications:**
    - Pregnant patients
    - Penetrating eye injury
    - Non-traumatic chest pain
  - **Precautions:**
    - Be prepared for advanced airway management
    - Rapid IV administration is associated with respiratory depression, apnea, and higher than usual increases in blood pressures
    - May increase schizophrenic symptoms

**OR**

### IF UNABLE TO ESTABLISH VASCULAR ACCESS

- **KETAMINE:**
  - 25mg IN/IM
  - May repeat 2x prn, in 5 minute intervals
    - **Contraindications - as noted above**
    - **Precautions - as noted above**

### IO INFUSION PAIN MANAGEMENT

- **LIDOCAINE:**
  - 40mg IO, over 2 minutes
    - Allow **LIDOCAINE** to dwell in IO space for 1 minute
    - Flush with **NORMAL SALINE** 10mL
  - May repeat at 20mg IO, 1x prn

# Pain Management *continued....*



## PEDIATRIC FOR PAIN MANAGEMENT

- **FENTANYL:**

- 1mcg/kg IV/IO, over 2 minutes
- 1.5mcg/kg IN/IM
- Max single dose 100mcg
- May repeat either route 1x prn, in 5 minutes, max total dose 200mcg
- **Contraindications:**
  - < 6 months old
- **Precautions:**
  - Monitor patient for respiratory depression
  - Discontinue if patient becomes drowsy
  - Can be reversed with NARCAN if necessary

## FOR SEVERE PAIN MANAGEMENT (PAIN SCALE 7 OR HIGHER)

- **KETAMINE (≥ 3 years old):**

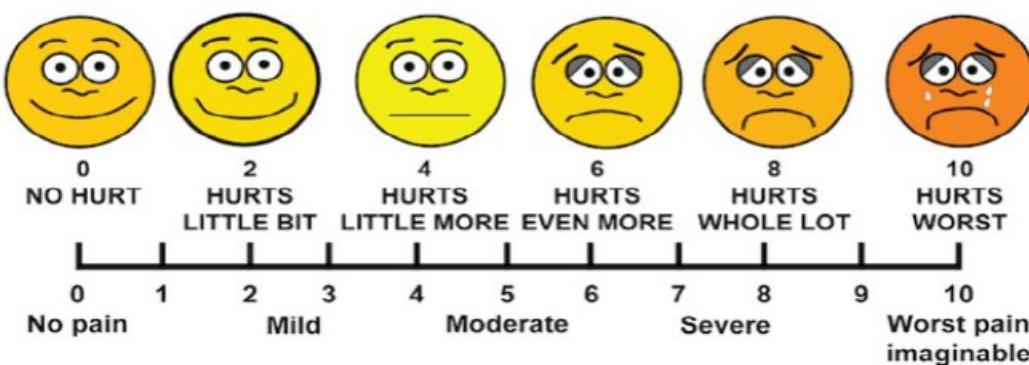
- 1mg/kg IN/IM
- May repeat 1x prn, in 5 minutes
- **Contraindications:**
  - Penetrating eye injury
- **Precautions:**
  - Be prepared for advanced airway management
  - May increase schizophrenic symptoms

## IO INFUSION PAIN MANAGEMENT

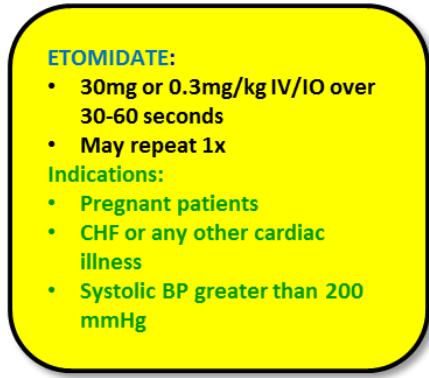
- **LIDOCAINE:**

- 0.5mg/kg IO, over 2 minutes
  - Allow **LIDOCAINE** to dwell in IO space for 1 minute
  - Flush with **NORMAL SALINE** 10mL
- Max total dose 40mg

## PAIN MEASUREMENT SCALE



# Adult Advanced Airway



Position & Suction

**Pre-oxygenate**

- 15 LPM via NC
- Assist ventilations via BVM prn.

**Pre-medicate:**  
ETOMIDATE OR KETAMINE

Paralyze if indicated

**ROCURONIUM:**

- 100 mg or 1mg/kg IV/IO
- May repeat 1x prn
- Max single dose 100mg

**Placement:**

- Direct or Video Laryngoscopy & Proof of Placement:
- Continuous Capnography
- Positive bilateral lung sounds

Successful?

NO

YES

**Paralysis Indications:**

- Apneic Status Epilepticus
- Trismus (lock-jaw) or clenched teeth
- EMS Captain or Flight Crew discretion

## KETAMINE:

- Dilute: 200 mg in a 50mL bag of **NORMAL SALINE**
  - Administer utilizing a 60 gtt set, run wide open
  - May repeat 1x for induction

### Precautions:

- Rapid IV administration is associated with higher increases in BP
- May increase schizophrenic symptoms

### Indications:

- Bronchoconstriction
- Septic shock
- Hypotension
- Violent/Combative
- Head injuries with suspected ICP

### Contraindications:

- Pregnant patients
- Penetrating eye injury
- Non-traumatic chest pain

## Paralysis Contraindications:

- Hypersensitivity/allergy to **ROCURONIUM** or other non-depolarizing neuromuscular blocking agents
- Predicted difficult intubation (i.e. obesity, short neck, small mouth)
- Major facial or laryngeal trauma
- Patient who cannot be assisted with a BVM

## Failed Airway

1. Reattempt ETT placement 1x
2. If unsuccessful, insert i-gel
3. If unable to oxygenate and ventilate via i-gel, attempt oxygenation & ventilation via BVM/NPA/OPA
4. If above interventions were unsuccessful, perform surgical cricothyotomy

## KETAMINE:

- Dilute: 200 mg in A 50mL bag of **NORMAL SALINE**
  - Administer utilizing a 60 gtt set, run wide open
  - May repeat 1x prn
  - Max single dose 200mg
  - Precautions - See above
  - Contraindications - See above

**VERSED:**

- 5mg IV/IO
- May repeat 1x prn, in 5 minutes
- Contraindication - Hypotension

**Post-intubation sedation**  
**Mandatory for all patients**

# $\geq 3$ years old Advanced Airway



**ETOMIDATE:**

- 0.3mg/kg IV/IO over 30-60 seconds. Max single dose 30 mg
- May repeat 1x

**Indications:**

- CHF or any other cardiac illness

**Paralysis Indications:**

- Apneic Status Epilepticus
- Trismus (lock-jaw) or clenched teeth
- EMS Captain or Flight Crew discretion

**VERSED:**

- 0.1mg/kg IV/IO
- May repeat 1x prn
- Max single dose of 5mg
- Max total dose 10mg
- Contraindication - Hypotension

Position & Suction

**Pre-oxygenate**

- 15 LPM via NC
- Assist ventilations via BVM prn.

**Pre-medicate:  
ETOMIDATE OR KETAMINE**

Paralyze if indicated

**ROCURONIUM:**

- 1mg/kg IV/IO
- May repeat 1x prn
- Max single dose 100 mg

**Placement:**

- Direct or Video Laryngoscopy &
- Proof of Placement:

  - Continuous Capnography
  - Positive bilateral lung sounds

Successful?

NO

**KETAMINE:**

- Dilute: 2mg/kg in a 50mL bag of **NORMAL SALINE**
- Administer utilizing a 60 gtt set, run wide open

- May repeat 1x for induction
- Max single dose 50mg

**Precautions:**

- Rapid IV administration is associated with higher increases in BP
- May increase schizophrenic symptoms

**Indications:**

- Bronchoconstriction
- Septic shock
- Hypotension
- Violent/Combative
- Head injuries with suspected ICP

**Contraindications:**

- Penetrating eye injury
- Non-traumatic chest pain

**Paralysis Contraindications:**

- Hypersensitivity/allergy to **ROCURONIUM** or other non-depolarizing neuromuscular blocking agents
- Predicted difficult intubation (i.e. obesity, short neck, small mouth)
- Major facial or laryngeal trauma
- Patient who cannot be assisted with a BVM

**Failed Airway**

1. Reattempt ETT placement 1x
2. If unsuccessful, insert i-gel
3. If unable to oxygenate and ventilate via i-gel, attempt oxygenation & ventilation via BVM/NPA/OPA
4. If above interventions were unsuccessful, perform needle cricothyrotomy

YES

**Post-intubation sedation  
Mandatory for all patients**

**KETAMINE:**

- Dilute: 2mg/kg in a 50mL bag of **NORMAL SALINE**
- Administer utilizing a 60 gtt set, run wide open

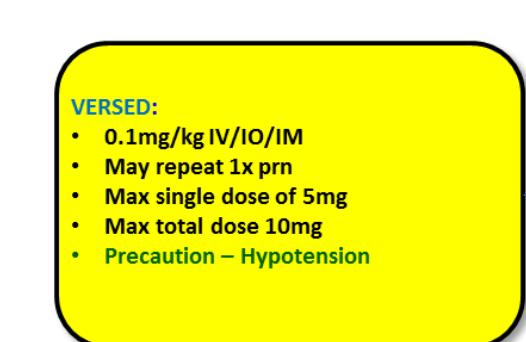
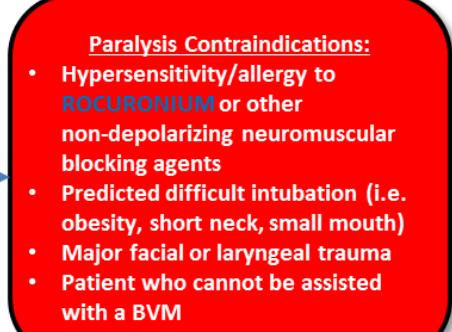
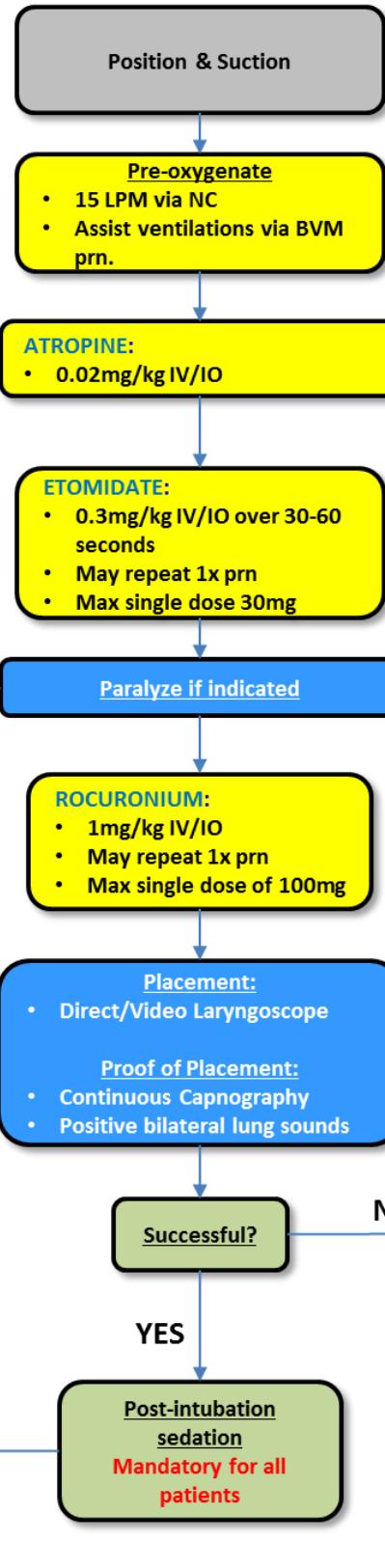
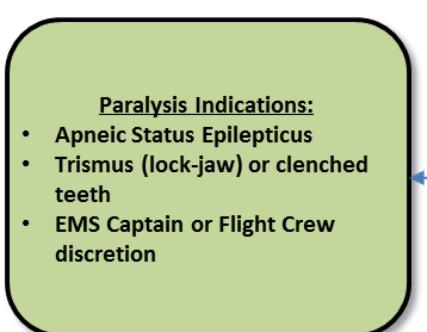
- May repeat 1x for induction

- Max single dose 50mg

- Precautions - See above

- Contraindications - See above

# < 3 years old Advanced Airway





# *Environmental Emergencies*

*Decompression Sickness (p. 96)*

*Non-Fatal Drowning (p. 97)*

*Heat Emergencies (p. 98)*

*Carbon Monoxide Exposure (p. 99)*

*Cyanide Exposure (p. 100)*

# Decompression Sickness



## INFORMATION

- **Signs & Symptoms**
  - Stroke-like symptoms
  - Visual disturbances
  - AMS
  - Paralysis or weakness
  - Numbness/tingling
  - Bowel/bladder dysfunction
- Any patient with the above signs & symptoms who has used SCUBA gear or compressed air within a 48-hour period shall be considered a decompression sickness patient
- Transport to St. Mary's Hyperbaric Chamber (encode prior to transport to confirm availability)
  - If unavailable transport to closest ED
- Contact **DAN (Diver Alert Network)** at **(919) 684-4326** for medical consultation as needed
  - Treatment recommendations from **DAN (Diver Alert Network)** should be followed
  - Document the treatment and the name of the representative on the ePCR Report
- Try to obtain an accurate history of the dive:
  - Depth of dives
  - Air mixture type in tanks
  - Number of dives
  - Interval between dives
- All dive equipment must be brought to the hospital



## ADULT & PEDIATRIC

- **POSITIONING:**
  - Transport patient in a supine position
- For cardiac arrhythmias, refer to appropriate protocol
- Rule out a tension pneumothorax
- **OXYGEN**
  - 15 LPM via NRB regardless of SpO<sub>2</sub>
- **NORMAL SALINE:**
  - Adult:
    - 500mL IV/IO, regardless of the blood pressure
  - Pediatric:
    - 10mL/kg IV/IO, regardless of the blood pressure, max dose 250mL

# Non-Fatal Drowning



## INFORMATION

- Consider spinal motion restriction in the presence of trauma (e.g., diving, rough surf, vehicle accident with subsequent submersion, etc.).
- All non-fatal drowning patients **MUST BE TRANSPORTED** to the hospital



## ADULT & PEDIATRIC



- CPAP - (10 cm H<sub>2</sub>O)** for pulmonary edema secondary to near drowning without hypotension:
  - Contraindications:
    - SBP < 90 mm Hg
    - Patients without spontaneous respirations
    - Patients with a decreased LOC (lethargic)
    - Patients < 30 kg

## IF PATIENT IS HYPOTENSIVE WITH CLEAR LUNG SOUNDS

- NORMAL SALINE:**
  - Adult:
    - 1L IV/IO, titrate to desired effect. Assess lung sounds and BP frequently.
    - May repeat 1x, prn
    - Precautions - Particular care must be taken in the presence of significant coronary heart disease, CHF, and renal failure patients
  - Pediatric:
    - 20mL/kg IV/IO, assess lung sounds and BP frequently
    - May repeat 2x prn, for age appropriate hypotension

## IF PATIENT IS HYPOTENSIVE WITH PULMONARY EDEMA

- PUSH-DOSE PRESSOR EPINEPHRINE (1:100,000):**
  - Adult:
    - Dilute:** Discard 9 mL of Epi 1:10,000 (0.1mg/mL) and draw up 9 mL of **NORMAL SALINE** to create Push-Dose Pressor Epi 1:100,000. This will yield 10mcg/mL.
      - Administer 1 mL/minute IV/IO, titrate to maintain SBP 100mm Hg
    - May repeat 2x prn, max total dose 300mcg (30 mL)
    - Contraindications - Hypotension secondary to blood loss**
    - Precautions:**
      - Rapid (1 minute) onset, short (5-10 minute) duration
      - Monitor heart rate and blood pressure throughout administration
  - Pediatric:
    - Dilute:** Discard 9 mL of Epi 1:10,000 (0.1mg/mL) and draw up 9 mL of **NORMAL SALINE** to create Push-Dose Pressor Epi 1:100,000. This will yield 10mcg/mL.
      - Administer 1 mL/minute IV/IO, titrate to maintain age appropriate SBP
    - May repeat 2x prn, max total dose 300mcg (30 mL)
    - Contraindications - Hypotension secondary to blood loss**
    - Precaution:**
      - DO NOT** administer faster than 1mL/minute
      - Push-Dose Pressor Epinephrine has a rapid (1 minute) onset, short (5-10 minute) duration
      - Monitor heart rate and blood pressure throughout administration

# Heat Emergencies



## INFORMATION

- Signs & Symptoms of **heat stroke** include any of the following:
  - AMS
  - Seizures
  - Hypotension
  - Sweating may be absent
- Patients with a heat-related illness associated with an altered mental status should be considered to have heat stroke once all the other possibilities for the AMS have been ruled out (hypoglycemia, drugs/alcohol, trauma, etc.).

When treating heat stroke:

**"COOL FIRST, TRANSPORT SECOND"**



## ADULT & PEDIATRIC



## ALL HEAT EMERGENCIES

- Move patient into the back of the rescue as soon as possible. Decrease the air-conditioning temperature in the patient compartment.
- Obtain a temperature
- Remove excessive clothing
- Provide oral hydration (preferably water) if patient is able to swallow and follow commands

## HEAT CRAMPS & HEAT EXHAUSTION

- **NORMAL SALINE:**
  - Adult:
    - 1L IV/IO, titrate to desired effect. Assess lung sounds and BP frequently.
    - May repeat 1x, prn
    - **Precautions - Particular care must be taken in the presence of significant coronary heart disease, CHF, and renal failure patients**
  - Pediatric:
    - 20mL/kg IV/IO, assess lung sounds and BP frequently
    - May repeat 2x prn, for age appropriate hypotension

## HEAT STROKE WITH TEMPERATURE OF > 103 DEGREES F OR ALTERED MENTAL STATUS

- Apply **ICE PACKS** to axilla and groin area.
- **NORMAL SALINE: (COLD NORMAL SALINE preferred, if available)**
  - Adult:
    - 1L IV/IO, titrate to desired effect. Assess lung sounds and BP frequently.
    - May repeat 1x, prn
    - **Precautions - Particular care must be taken in the presence of significant coronary heart disease, CHF, and renal failure patients**
  - Pediatric:
    - 20mL/kg IV/IO, assess lung sounds and BP frequently
    - May repeat 2x prn, for age appropriate hypotension

# Carbon Monoxide Exposure



## INFORMATION

- Carbon Monoxide (CO) properties:
  - Chemical asphyxiant
  - Colorless
  - Odorless
  - Tasteless
  - Slightly less dense than air
  - Toxic to humans when encountered in concentrations above **35 parts per million (ppm)**
  - Lower doses of CO can also be harmful due to a cumulative effect
- Patients exposed to carbon monoxide (smoke inhalation, etc.) require a full head to toe patient examination including SpCO monitoring with the rainbow sensor (located on the EMS Captains' and Special Operations' vehicles).
- All rescuing crew members shall wear their SCBA if the patient is in a hazardous environment.
- Consider Cyanide Exposure.
  - Refer to the "Cyanide Exposure" protocol (pg. 100), if applicable



## ADULT & PEDIATRIC



- Apply rainbow sensor and obtain SpCO readings
- **OXYGEN:**
  - 15 LPM via NRB regardless of SpO<sub>2</sub>, unless the patient requires ventilatory support

## IF SPCO IS > 20% OR PATIENT PRESENTS WITH ANY OF THE FOLLOWING SYMPTOMS

- Headache
- Nausea/Vomiting
- Dizziness
- Altered Mental Status
- Chest pain
- Dyspnea
- Visual Disturbances
- Seizures
- Syncope
- Transport to St. Mary's Hyperbaric Chamber (encode prior to transport to confirm availability)
  - If unavailable transport to closest ED.

### WARNING

- Patients with CO exposures can have normal pulse oximetry readings and still be hypoxic.
- Strong consideration for hyperbaric treatment should be given to all pediatric and obstetrical patients with confirmed CO exposures due to their higher susceptibility to the effects of CO exposures regardless of SpCO level or symptoms.

# Cyanide Exposure



## INFORMATION

### Signs & Symptoms:

- AMS
  - Pupil Dilation
  - General Weakness
  - Confusion
  - Bizarre behavior
  - Excessive sleepiness
  - Coma
  - Shortness of breath
  - Headache
  - Dizziness
  - Seizures
- Cyanide exposures may result from inhalation, ingestion or absorption from various cyanide containing compounds, including exposure to fire or smoke in an enclosed space.
  - Direct cyanide exposure (non-smoke inhalation) is a Hazardous Materials Incident.
  - Cyanokits are located on the EMS Captains' and Special Operations' vehicles
  - Consider Carbon Monoxide Exposure.
    - Refer to the "Carbon Monoxide Exposure" protocol (pg. 99), if applicable



### ADULT & PEDIATRIC



### CONFIRMED OR SUSPECTED CYANIDE EXPOSURE

- **OXYGEN:**
  - 15 LPM via NRB regardless of SpO<sub>2</sub>, unless the patient requires ventilatory support
- **CYANOKIT:**
  - **Adult:**
    - Preparation:
      - Reconstitute 5g vial by adding 200 mL of **NORMAL SALINE** to the vial by using the transfer spike.
      - With the vial in the upright position, fill to the "fill line"
      - Mix the solution by rocking or rotating the vial for 30 seconds. **DO NOT SHAKE**
      - Use vented IV tubing and infuse as indicated below
    - 5g IV/IO, infused over 10-15 minutes
    - 5gtts/sec (broken infusion stream)
    - May repeat 1x prn.
    - The Cyanokit should be administered through a separate/dedicated IV/IO line
  - **Pediatric:**
    - Preparation and dosing - Refer to "Handtevy" system
    - May repeat 1x prn
    - The Cyanokit should be administered through a separate/dedicated IV/IO line
- Transport to St. Mary's Hyperbaric Chamber (encode prior to transport to confirm availability)
  - If unavailable transport to closest ED



## Trauma

*Standing Orders (p. 102)*

*Trauma Arrest Standing Orders (p. 103)*

*Start Triage (p. 104)*

*Jump Start Triage (p. 105)*

*Trauma Criteria (Adult) (p. 106)*

*Trauma Criteria (Pediatric) (p. 107)*

*Burn Injuries (p. 108)*

*Chest Trauma (p. 110)*

*Head Injuries (p. 111)*

*Open Fractures (p. 112)*

*Hemorrhagic Shock (p. 113)*

*Neurogenic Shock (p. 114)*

*Trauma in Pregnancy (p. 115)*

# Trauma Standing Orders



## INFORMATION



## ADULT & PEDIATRIC



- The following conditions should be managed as soon as they are discovered:
  - M-Massive hemorrhage
  - A-Airway control
  - R-Respiratory Support
  - C-Circulation
  - H-Head Injury/Hypothermia
- Unless otherwise noted**, IV fluids should be given for a SBP < 90 mm Hg and should be given at a rate (boluses) necessary to maintain peripheral pulses (which is typically a SBP of 80-90 mm Hg).

## ULTRASOUND FAST EXAM

- A FAST exam can be performed during transport of the following injuries:
  - Blunt force trauma to abdomen or thorax
  - Penetrating injury to abdomen or thorax
  - Undifferentiated hypotension in the presence of trauma
- Can be performed to identify possible:
  - Intra-abdominal hemorrhaging
  - Intra-thoracic hemorrhaging
  - Pericardial hemorrhaging
  - Cardiac motion in PEA
- This exam shall be done in a prompt fashion and should **NOT** delay transport
- FAST Exam findings shall be communicated to the receiving facility and documented in the ePCR

Glasgow Coma Scale		Score
Eye Opening	Spontaneously	4
	To Speech	3
	To Pain	2
	None	1
Verbal Response	Orientated	5
	Confused	4
	Inappropriate	3
	Incomprehensible	2
	None	1
Motor Response	Obeys Commands	6
	Localizes to Pain	5
	Withdraws from Pain	4
	Flexion to Pain	3
	Extension to Pain	2
	None	1
Maximum Score		15

# Trauma Arrest Standing Orders



## ADULT & PEDIATRIC



### DETERMINATION OF DEATH

- Resuscitation should **NOT** be attempted for trauma patients that have **ALL 3** of the following presumptive signs of death present:
  - Apneic
  - Asystole
  - Fixed and dilated pupils
- OR**
- Injuries incompatible with life (e.g., decapitation, massive crush injury, incineration, etc.)

### SPECIAL CONSIDERATIONS

- **PEA:**
  - Defined as an organized rhythm greater than 20 bpm. Anything less is considered asystole and should be treated as such.
- **PENETRATING CHEST TRAUMA:**
  - Bilateral needle decompression may be performed in an attempt to achieve ROSC
  - Resuscitation efforts **DO NOT** need to be started if the patient did not regain pulses immediately following the bilateral needle decompression
- **TRANSPORT:**
  - If Trauma Hawk is not available and ground transport is greater than 40 minutes, it is acceptable to transport to the nearest ED

## **ONLY TRAINED EMS CAPTAINS/FLIGHT CREW PERSONNEL**

### ULTRASOUND

- To confirm any observation of cardiac motion in PEA
  - Cardiac motion present:
    - Continue resuscitation efforts and treat reversible causes
  - Cardiac motion **NOT** present:
    - Resuscitation efforts can be discontinued

### FINGER THORACOSTOMY

- Indications:
  - Known or suspected injury to the chest and/or abdomen
  - Site:
    - 4<sup>th</sup>/5<sup>th</sup> intercostal space of the midaxillary line
- Contraindications:
  - Suffered devastating head trauma
  - Unwitnessed cardiac arrest with blunt thoracic trauma
  - Loss of cardiac output for greater than 10 minutes

# START Triage



Move the walking wounded

MINOR

No respirations after head tilt

DEAD

Respirations > 30/min.

IMMEDIATE

Perfusion

No radial pulse

Cap refill > 2 sec (*Control Bleeding*)

IMMEDIATE

Mental Status

Unable to follow simple commands

IMMEDIATE

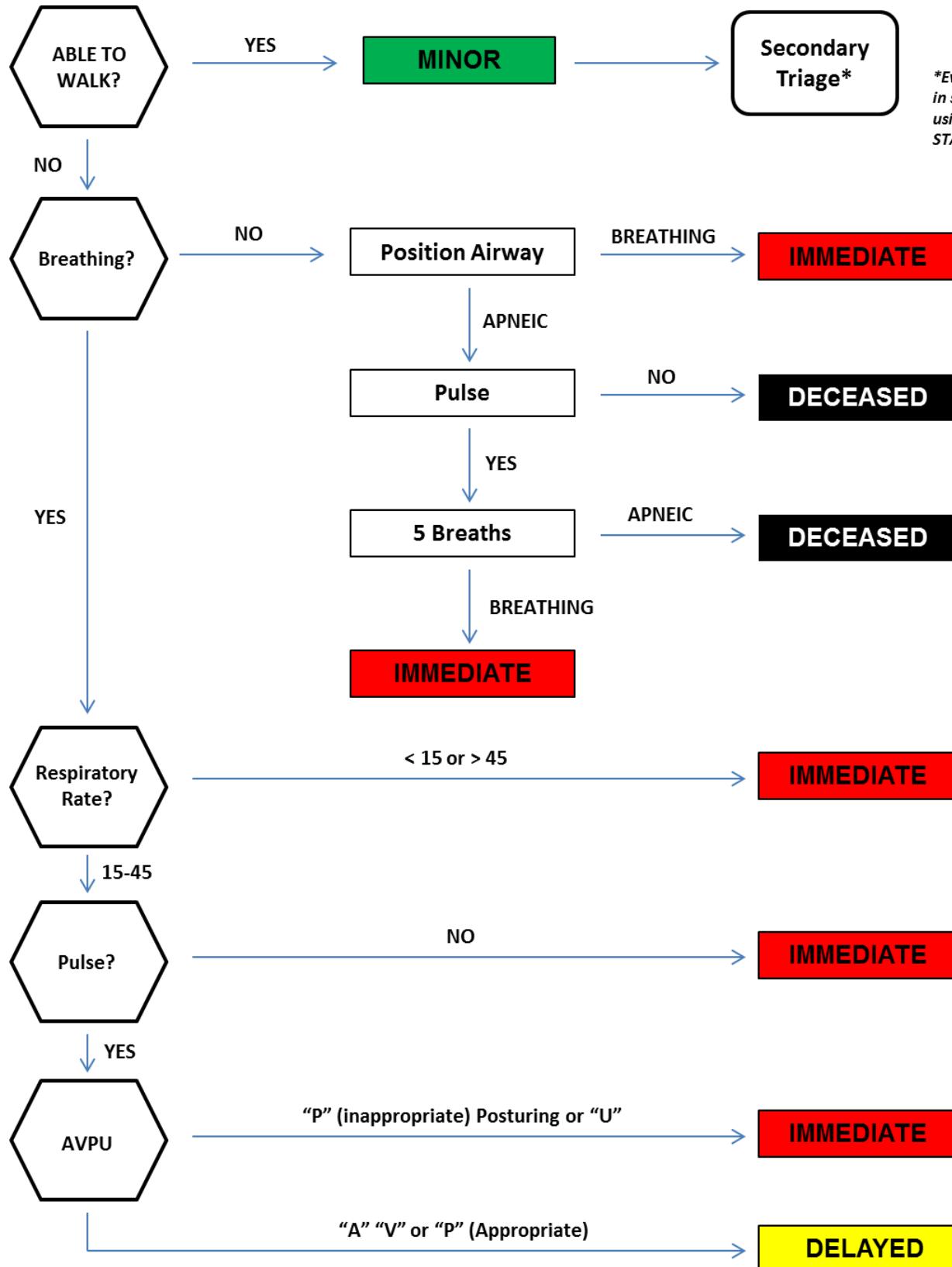
Otherwise

DELAYED

The goal of the START program is to provide the  
“greatest good for the greatest number of patients.”

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# JumpSTART Triage 1-8 years old



\*Evaluate infants first in secondary triage using the entire Jump-START algorithm



# Trauma Criteria (Adult)



## ADULT TRAUMA TRIAGE CRITERIA

### ANY 1 IN THIS CATEGORY (RED)

- Active airway assistance<sup>1</sup> or respiratory rate <10 or >29 BPM
- Lack of radial pulse with a sustained HR >120 BPM or BP <90 mmHg
- Glasgow Coma Scale (GCS) ≤ 13 or presence of paralysis, or suspicion of spinal cord injury or loss of sensation
- 2<sup>nd</sup> or 3<sup>rd</sup> degree burns to 10% or more TBSA\*
- Amputation at or above the wrist or ankle\*
- Any penetrating injury to the head, neck, or torso<sup>3\*</sup>
- Penetrating injury to the extremity at or above the elbow or knee\*
- GSW to the extremity at or above the wrist or ankle\*
- Chest wall instability or deformity (flail chest)
- Crushed, mangled, degloved, or pulseless extremity
- Fracture of two or more long bones<sup>4</sup>
- Unstable pelvic fractures\*
- Severe facial injury/fractures with potential airway compromise
- Blunt abdominal or chest trauma in patient with history of paralysis (paraplegia or quadriplegia)\*
- Pregnancy ≥ 20 weeks with abdominal pain after blunt trauma<sup>5</sup>
- Electrocution or lightning injury with loss of consciousness or visible signs of injury

### ANY 2 IN THIS CATEGORY (BLUE)

- Sustained heart rate of ≥ 120 beats/min
- Head injury with loss of consciousness, amnesia or new altered mental status
- Soft tissue loss<sup>2</sup>
- Non GSW penetrating injury to the extremities distal to the elbow or distal to the knee
- Single long bone fracture site due to MVC<sup>4</sup>
- Single long bone fracture or pelvic fracture in patient with bleeding disorder or anticoagulated
- 55 years or older
- Ejection or thrown from automobile, motorcycle, or golf cart
- Ejection or thrown from a horse with anatomical injury
- Death in same passenger compartment\*
- Intrusion including roof: >12 inches at occupant site or >18 inches at any other site into the passenger compartment\*
- Vehicle telemetry data consistent with high risk of injury<sup>6\*</sup>
- Fall 10 ft or more
- Auto vs. pedestrian/bicyclist thrown, run over or with impact and signs of anatomical injury
- Motorcycle, golf cart, or ATV crash with signs of anatomical injury

Any one (1) or more RED = "Trauma Alert"; Any two (2) or more BLUE = "Trauma Alert"

1. Airway assistance includes manual jaw thrust, continuous suctioning, or use of other adjuncts to assist ventilatory efforts.
  2. Includes deep flap avulsion (>5 inches)
  3. Excluding superficial wounds of the head and torso in which the depth of the wound can be determined.
  4. Long bone fracture sites are defined as the (1) shaft of the humerus, (2) radius and ulna, (3) femur, (4) tibia and fibula.
  5. Pregnant patients meeting Trauma Alert criteria should be transported to St. Mary's Trauma Center by air whenever possible.
  6. Vehicle Telemetry Data when available can be relayed to dispatch; the data can assist in predicting potential serious injuries from the data collected at the time of the crash.
- In the event that a patient does not meet either 1 Red or 2 Blue criteria during the assessment of the trauma patient, the paramedic can call a trauma alert, if in his/her judgement, the patient's condition warrants such an action. Where paramedic judgement is used, it shall be documented.
  - Any of the above criteria that has an asterisk (\*) next to it represents criteria that is the same for both Adult & Pediatric

# Trauma Criteria (Pediatric)



## PEDIATRIC TRAUMA TRIAGE CRITERIA

### ANY 1 IN THIS CATEGORY (RED)

- Active airway assistance<sup>1</sup> or respiratory rate <20 in infants, respiratory rate <10 in children 1-15 years old
- Faint or non-palpable carotid or femoral pulse or SBP <50 mmHg
- Altered mental status<sup>2</sup> or presence of paralysis or suspicion of spinal cord injury or loss of sensation
- Major soft tissue disruption<sup>5</sup> or major flap avulsion
- 2<sup>nd</sup> or 3<sup>rd</sup> degree burns to 10% or more TBSA\*
- Any penetrating injury to the head, neck, or torso<sup>3</sup>\*
- Penetrating injury to the extremity at or above the elbow or knee\*
- GSW to the extremity at or above the wrist or ankle\*
- Amputation at or above the wrist or ankle\*
- Open long bone fracture or multiple fracture sites or multiple dislocations<sup>4</sup>
- Unstable pelvic fracture\*
- Severe facial injury with potential airway compromise
- Blunt abdominal or chest trauma in patient with history of paralysis (paraplegia or quadriplegia)\*
- Blunt head, chest, abdominal trauma in patient with bleeding disorder or on anticoagulants with a high risk of bleeding
- Auto vs. pedestrian/bicyclist thrown, run over or with impact and signs of anatomical injury
- Ejection from automobile, ATV, golf cart or horse with signs of anatomical injury
- Electrocution or lightning strike

### ANY 2 IN THIS CATEGORY (BLUE)

- Weight ≤20 kg
- Carotid or femoral pulses palpable, but the radial or pedal pulse not palpable or SBP <90 mmHg
- Loss of consciousness or amnesia
- Penetrating injury to the extremities distal to the elbow or distal to the knee
- Single long bone fracture or dislocation due to MVC<sup>4</sup> or pelvic fracture in patient on Coumadin/anticoagulants with high risk of bleeding
- Ejection (partial or complete) from automobile
- Death in same passenger compartment\*
- Intrusion including roof: >12 inches at occupant site or >18 inches at any other site into the passenger compartment\*
- Vehicle telemetry data consistent with high risk of injury<sup>6</sup>\*
- Fall >10 feet or 2-3 times the height of the child

Any one (1) or more RED = "Trauma Alert"; Any two (2) or more BLUE = "Trauma Alert"

1. Airway assistance includes manual jaw thrust, continuous suctioning, or use of other adjuncts to assist ventilatory efforts.
  2. Altered mental states include drowsiness, lethargy, inability to follow commands, unresponsiveness to voice, totally unresponsive.
  3. Excluding superficial wounds of the head and torso in which the depth of the wound can be determined.
  4. Long bone fracture sites are defined as the (1) shaft of the humerus, (2) radius and ulna, (3) femur, (4) tibia and fibula.
  5. Includes major de-gloving injury
  6. Vehicle Telemetry Data when available can be relayed to dispatch; the data can assist in predicting potential serious injuries from the data collected at the time of the crash.
- 
- In the event that a patient does not meet either 1 Red or 2 Blue criteria during the assessment of the trauma patient, the paramedic can call a trauma alert, if in his/her judgement, the patient's condition warrants such an action. Where paramedic judgement is used, it shall be documented.
  - Any of the above criteria that has an asterisk (\*) next to it represents criteria that is the same for both Adult & Pediatric



# Burn Injuries



## INFORMATION

- Advanced airway procedures shall be considered for patients with respiratory involvement (i.e., hoarse voice, singed nasal hairs, carbonaceous sputum in the nose or mouth, stridor or facial burns)

### FIRST DEGREE BURNS

- Involves only the epidermis and are characterized as red and painful

### SECOND DEGREE BURNS

- Involves the epidermis and varying portions of the underlying dermis with blistering

### THIRD DEGREE BURNS

- Involves deep tissue damage and will appear as thick, dry, white, leathery burns (regardless of race or skin color)



## ADULT & PEDIATRIC



- Stop the burning process by irrigating with copious amounts of room temperature water or **NORMAL SALINE** for 2 minutes. **Never apply ice directly to burns.**
- Determine Total Body Surface Area (TBSA) percentage of the burn
- **DO NOT** attempt to remove tar, clothing, etc., if adhered to the skin
- Remove jewelry and watches from burned area
- Consider Pain Management Protocol
- **DO NOT** use IM route for medication administration
- Consider Carbon Monoxide and Cyanide Exposure

### 1<sup>st</sup> & 2<sup>nd</sup> DEGREE BURNS < 15% TBSA or 3<sup>rd</sup> DEGREE BURNS < 5% TBSA

- Apply a dry sterile dressing

### 2<sup>nd</sup> DEGREE BURNS > 15% TBSA or 3<sup>rd</sup> DEGREE BURNS > 5% TBSA

- Apply a dry sterile burn sheet
- **NORMAL SALINE:**
  - Adult:
    - 500mL IV/IO, regardless of the blood pressure
  - Pediatric:
    - 10mL/kg IV/IO, regardless of the blood pressure, max dose 250mL

### ELECTRICAL BURNS

- Treat associated burns as indicated
- If patient is in cardiac arrest, follow appropriate protocol

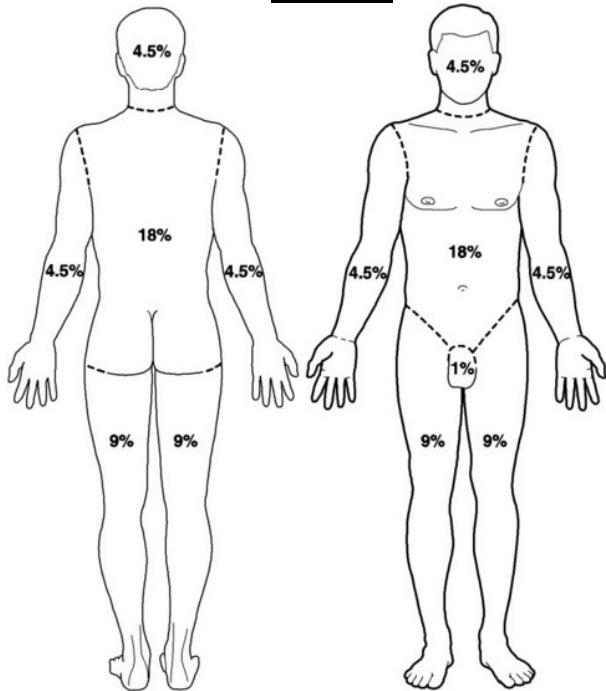
### CHEMICAL BURNS

- Irrigate liquid chemical burns with copious amounts of water or sterile saline. Brush off dry chemicals prior to irrigation.
- Remove patient's clothing and ensure that the patient is decontaminated prior to transport, in order to avoid contaminating personnel and equipment. Personnel shall wear protective clothing and/or respiratory protection as needed when removing chemicals.

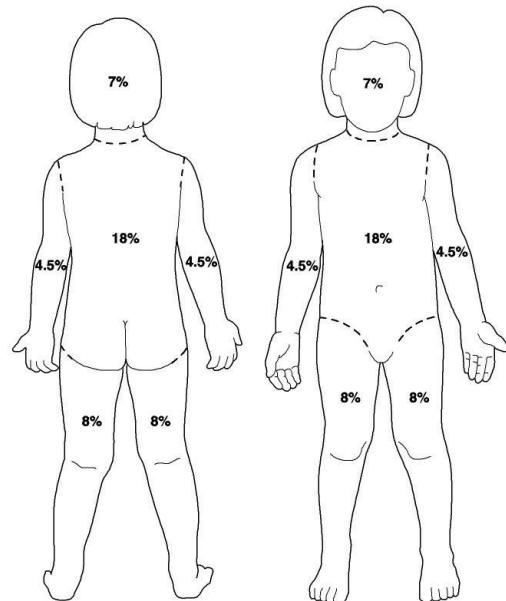
# Burn Injuries *continued....*



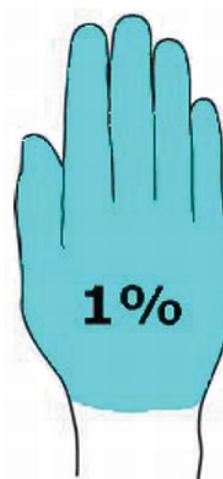
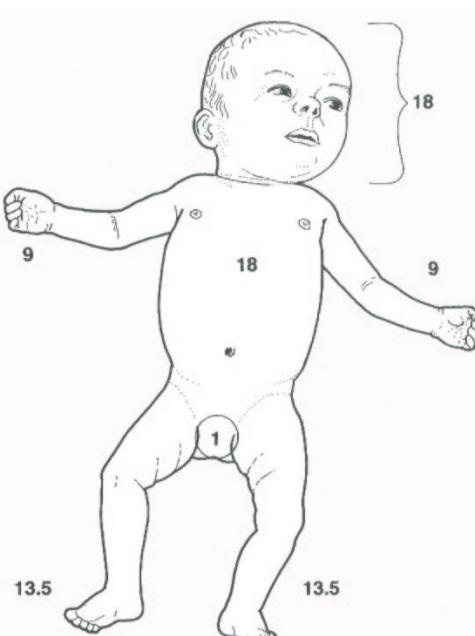
## Adult



## Child



## Infant



Palm and fingers  
of patient  
= 1% TBSA



# Chest Trauma



## INFORMATION

### FLAIL CHEST

- Occurs when 2 or more adjacent ribs are fractured

### OPEN PNEUMOTHORAX (SUCKING CHEST WOUND)

- Occurs when air enters the pleural space, causing the lung to collapse

### TENSION PNEUMOTHORAX

- Occurs when air continues to enter the pleural space without an exit or release, causing an increase in intrathoracic pressure
  - Intrathoracic pressure decreases cardiac output and gas exchange.



## ADULT & PEDIATRIC



### PENETRATING OBJECTS

- Stabilize with a bulky dressing

### FLAIL CHEST

- Stabilize with a bulky dressing.

### OPEN PNEUMOTHORAX (SUCKING CHEST WOUND)

- Apply a vented chest seal or occlusive dressing to all open chest wounds and monitor for signs & symptoms of a tension pneumothorax
  - Apply on expiration if possible

### TENSION PNEUMOTHORAX

- Needle decompression should be performed when **ALL** of the following findings are present:
  - Respiratory distress or difficulty ventilating with a BVM
  - Decreased or absent breath sounds to the affected side
  - Decompensated shock (SBP < 90 mm Hg)
- Primary site:
  - 5<sup>th</sup> intercostal space of the midaxillary line
- Secondary site:
  - 2<sup>nd</sup> or 3<sup>rd</sup> intercostal space, midclavicular line

# Head Injuries



## INFORMATION

- Patients with a depressed LOC may be unable to protect their airway
- Adequate oxygenation of the injured brain is critical to preventing secondary injury
- Consider Advanced Airway Management.
  - Especially for patients with a GCS of < 9
- If patient becomes combative refer to the "Chemical Restraint" protocol (pg. 88)

## **INTRACRANIAL PRESSURE/HERNIATION SIGNS INCLUDE:**

- A decline in the GCS of 2 or more points
- Development of a sluggish or nonreactive pupil
- Paralysis or weakness on 1 side of the body
- Cushing's Triad:
  - A widening pulse pressure (increasing systolic, decreasing diastolic)
  - Change in respiratory pattern (irregular respirations)
  - Bradycardia



## ADULT & PEDIATRIC



### ALL HEAD INJURIES

- **OXYGEN:**
  - 15 LPM via NRB regardless of SpO<sub>2</sub>, unless the patient requires ventilatory support
- **NORMAL SALINE:**
  - **Adult:** (**only enough to maintain SBP of 110-120**)
    - 1L IV/IO, titrate to desired effect. Assess lung sounds and BP frequently.
    - May repeat 1x, prn
    - **Precautions - Particular care must be taken in the presence of significant coronary heart disease, CHF, and renal failure patients**
  - **Pediatric:** (**only enough to maintain an age appropriate SBP within normal range. Refer to "Handtevy" system**)
    - 20mL/kg IV/IO, assess lung sounds and BP frequently
    - May repeat 2x prn for age appropriate hypotension

### DEPRESSED OR OPEN SKULL FRACTURE

- Pressure dressings should not be applied to depressed or open skull fractures unless there is significant hemorrhage present, as this can cause an increase in ICP

### ICP/HERNIATION

- **POSITIONING:**
  - 30° head elevation
  - Maintain EtCO<sub>2</sub> between **30-35 mm Hg** and SpO<sub>2</sub> > 90% while continuously monitoring BP

### **WARNING**

**A SINGLE INSTANCE OF HYPOTENSION OR HYPOXIA (SpO<sub>2</sub> < 90%) IN PATIENTS WITH A BRAIN INJURY MAY INCREASE THE MORTALITY RATE BY 150%.**

# Open Fracture



## INFORMATION

### OPEN FRACTURE

- Broken bone with extensive tissue damage and/or gross contamination and/or visible bone
- Gross contamination, such as leaves or gravel, should be removed if possible
- Cover open fractures with a moist sterile dressing
- Fractures should be splinted in the position found
  - **Exception:** No pulse present **OR** the patient cannot be transported due to the extremity's unusual position
    - 2 attempts can be made to place the injured extremity in a normal anatomical position
    - Discontinue attempts if the patient complains of severe pain or if there is resistance to movement felt
    - Reassess neurovascular status before and after repositioning of patient's extremity



## ADULT

### CEFTRIAXONE (ROCEPHIN):

- Reconstitute 2g of Ceftriaxone using 20 mL of **NORMAL SALINE** in the medication vial
- **Dilute:** 2g of Ceftriaxone in a 50mL bag of **NORMAL SALINE**
  - Administer over 10 minutes IV/IO by utilizing a 15 gtt set delivering 75 gtts/min (1.25 gtts/sec)
- **Contraindications:**
  - Allergy to Cephalosporin antibiotics (e.g., Ancef, Ceclor, Cefdinir, Keflex)
  - Neonates



## PEDIATRIC

### CEFTRIAXONE (ROCEPHIN):

- Reconstitute 2g of Ceftriaxone using 20 mL of **NORMAL SALINE** in the medication vial
- **Dilute:** 50mg/kg of Ceftriaxone in a 50mL bag of **NORMAL SALINE**
  - Administer over 10 minutes IV/IO by utilizing a 15 gtt set delivering 75 gtts/min (1.25 gtts/sec). **Refer to Handtevy for proper dosing.**
- **Contraindications:**
  - Allergy to Cephalosporin antibiotics (e.g., Ancef, Ceclor, Cefdinir, Keflex)
  - Neonates

# Hemorrhagic Shock



## INFORMATION

### COMPENSATED SHOCK

- Anxiety
- Agitation
- Restlessness
- Normotensive
- Capillary refill normal to delayed
- Tachycardia

### DECOMPENSATED SHOCK

- Decreased LOC
- Hypotension
- Peripheral cyanosis
- Delayed capillary refill
- Inequality of central/distal pulses
- Tachycardia



### ADULT & PEDIATRIC



- Maintain body temperature with blankets and consider increasing the temperature in the patient compartment
- Control all major external bleeding
- Establish bilateral vascular access, utilizing largest catheter size possible
- **NORMAL SALINE:** (only enough to maintain peripheral pulses)
  - Adult:
    - 1L IV/IO, titrate to desired effect. Assess lung sounds and BP frequently.
    - May repeat 1x, prn
    - **Precautions - Particular care must be taken in the presence of significant coronary heart disease, CHF, and renal failure patients**
  - Pediatric:
    - 20 mL/kg IV/IO. Assess lung sounds and BP frequently.
    - May repeat 2x prn, for age appropriate hypotension

# Neurogenic Shock



## INFORMATION

### **Signs & Symptoms:**

- Warm/Dry skin (especially below the area of the injury)
- Hypotension with a heart rate within normal limits
- Paralysis



### **ADULT**

- Maintain body temperature with blankets and consider increasing the temperature in the patient compartment
- **NORMAL SALINE:**
  - 1L IV/IO, titrate to desired effect. Assess lung sounds and BP frequently.
  - May repeat 1x, prn
  - **Precautions - Particular care must be taken in the presence of significant coronary heart disease, CHF, and renal failure patients**

## IF PATIENT REMAINS HYPOTENSIVE

### **PUSH-DOSE PRESSOR EPINEPHRINE (1:100,000):**

- **Dilute:** Discard 9 mL of Epi 1:10,000 (0.1mg/mL) and draw up 9 mL of **NORMAL SALINE** to create Push-Dose Pressor Epi 1:100,000. This will yield 10mcg/mL.
  - Administer 1 mL/minute IV/IO, titrate to maintain SBP 100mm Hg
- May repeat 2x prn, max total dose 300mcg (30 mL)
- **Contraindications - Hypotension secondary to blood loss**
- **Precautions:**
  - Rapid (1 minute) onset, short (5-10 minute) duration
  - Monitor heart rate and blood pressure throughout administration



### **PEDIATRIC**

- Maintain body temperature with blankets and consider increasing the temperature in the patient compartment
- **NORMAL SALINE:**
  - 20mL/kg IV/IO, assess lung sounds and BP frequently
  - May repeat 2x prn, for age appropriate hypotension

## IF PATIENT REMAINS HYPOTENSIVE

### **PUSH-DOSE PRESSOR EPINEPHRINE (1:100,000):**

- **Dilute:** Discard 9 mL of Epi 1:10,000 (0.1mg/mL) and draw up 9 mL of **NORMAL SALINE** to create Push-Dose Pressor Epi 1:100,000. This will yield 10mcg/mL.
  - Administer 1 mL/minute IV/IO, titrate to maintain age appropriate SBP
- May repeat 2x prn, max total dose 300mcg (30 mL)
- **Contraindications - Hypotension secondary to blood loss**
- **Precaution:**
  - **DO NOT** administer faster than 1mL/minute
  - Push-Dose Pressor Epinephrine has a rapid (1 minute) onset, short (5-10 minute) duration
  - Monitor heart rate and blood pressure throughout administration

# Trauma in Pregnancy



## INFORMATION

### PHYSIOLOGICAL CHANGES DURING PREGNANCY

- Due to the following physiological changes in pregnancy, it is often difficult to assess for shock:
  - Mother's heart rate increases
  - By the third trimester, the HR can be 15-20 beats per minute above normal
  - Both the systolic and diastolic blood pressures drop 5-15 mm Hg during the second trimester
  - The mother's cardiac output and blood volume increases
    - Therefore, the pregnant patient may lose 30-35% of her blood volume before the signs & symptoms of shock become apparent
  - Supine hypotension usually occurs in the third trimester



### ADULT

- Assess for vaginal bleeding and a rigid abdomen
  - In the third trimester, this could indicate an abruptio placenta or a ruptured uterus
- **POSITIONING:**
  - Pregnant patients not requiring spinal motion restriction shall be transported on their left side
  - If a pregnant patient requires spinal motion restriction, place 4-6 inches of padding under the patient's right side while maintaining normal anatomical alignment

### ALL THIRD TRIMESTER PREGNANCY TRAUMA PATIENTS

- **OXYGEN**
  - 15 LPM via NRB regardless of SpO<sub>2</sub>, unless the patient requires ventilatory support

### IF HYPOTENSIVE

- Establish bilateral vascular access, utilizing largest catheter size possible
- **NORMAL SALINE (only enough to maintain peripheral pulses):**
  - 1L IV/IO, titrate to desired effect. Assess lung sounds and BP frequently
  - May repeat 1x, prn
  - **Precautions - Particular care must be taken in the presence of significant coronary heart disease, CHF, and renal failure patients**

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## ***Obstetrical***

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***Standing Orders (p.118)***

***1<sup>st</sup> & 2<sup>nd</sup> Trimester Complications (p.119)***

***3<sup>rd</sup> Trimester Complications (p. 120)***

***Pre-Eclampsia/Eclampsia (p. 121)***

***Meconium Staining (p. 122)***

***Normal Delivery (p. 123)***

***Delivery Complications (p. 124)***



# Standing Orders



## INFORMATION

- Obstetrical patients are defined as gestation > 20 weeks

## PHYSIOLOGICAL CHANGES DURING PREGNANCY

- Mother's heart rate increases
- By the third trimester, the HR can be 15-20 beats per minute above normal
- Both the systolic and diastolic blood pressures drop 5-15 mm Hg during the second trimester
- The mother's cardiac output and blood volume increases
  - Therefore, the pregnant patient may lose 30-35% of her blood volume before the signs & symptoms of shock become apparent
- Supine hypotension usually occurs in the third trimester



## ADULT

### POSITIONING:

- Transport patients in their third trimester and not in active labor on their left side

## IF WATER HAS BROKE

- Document:
  - Time
  - Color of fluid

## IF BLOOD PRESENT

- Document:
  - Time
  - Volume

## IF CROWNING

- Prepare for a field delivery
- **DO NOT** delay transport to the closest appropriate hospital

## FOCUSSED HISTORY

- Obtain:
  - Number of previous pregnancies (GRAVIDA)
  - Number of previous viable births (PARA)
  - Documented multiple births?
  - Gestational Diabetes?
  - Narcotic use?
  - Due date?
  - Frequency and length of contractions?
  - Feeling of having to push or have a bowel movement?

# ***1<sup>st</sup> & 2<sup>nd</sup> Trimester Complications***



## **INFORMATION**

### **1<sup>st</sup> TRIMESTER**

- Weeks 1 - 12 of the pregnancy

### **2<sup>nd</sup> TRIMESTER**

- Weeks 13 - 27 of the pregnancy

### **ECTOPIC PREGNANCY (usually first trimester)**

- **Signs & Symptoms:**
  - Sudden onset of severe lower abdominal pain
  - Vaginal bleeding
  - Amenorrhea (absence of menstruation)
  - Referred pain to the left shoulder
  - Cullen's Sign (periumbilical ecchymosis)
  - Grey Turner's sign (ecchymosis of the flanks)
  - Abdominal distention and tenderness

### **SPONTANEOUS ABORTION (usually before 20 weeks of gestation)**

- **Signs & Symptoms:**
  - Abdominal cramping
  - Vaginal bleeding
  - Passage of tissue or fetus



### **ADULT**

- Assess and treat for shock
- Rapidly transport to any approved OB or GYN facility

### **FOR ACTIVE BLEEDING**

- Loosely place trauma pads over the vagina in an effort to stop the flow of blood
- **DO NOT** pack the vagina

### **IF HYPOTENSIVE**

- **NORMAL SALINE:**
  - 1L IV/IO, titrate to desired effect. Assess lung sounds and BP frequently.
  - May repeat 1x, prn
  - **Precautions** - Particular care must be taken in the presence of significant coronary heart disease, CHF, and renal failure patients

# 3<sup>rd</sup> Trimester Complications



## INFORMATION

### THIRD TRIMESTER

- Weeks 28 - delivery

### PLACENTA ABRUPTIO

- Signs & Symptoms:

- Sudden onset of severe abdominal pain and tenderness
- Painful uterine contractions
- Vaginal bleeding with dark red blood
- Patient may present in shock

### PLACENTA PREVIA

- Signs & Symptoms:

- Painless vaginal bleeding (bright red blood)

### UTERINE RUPTURE

- Signs & Symptoms:

- Sudden, intense abdominal pain
- Vaginal bleeding



### ADULT

- Assess and treat for shock
- If in cardiac arrest refer to the "Cardiac Arrest Special Considerations" protocol (pg. 75)
- POSITIONING:
  - During transport, place 4-6 inches of padding under the patient's right side while maintaining normal anatomical alignment

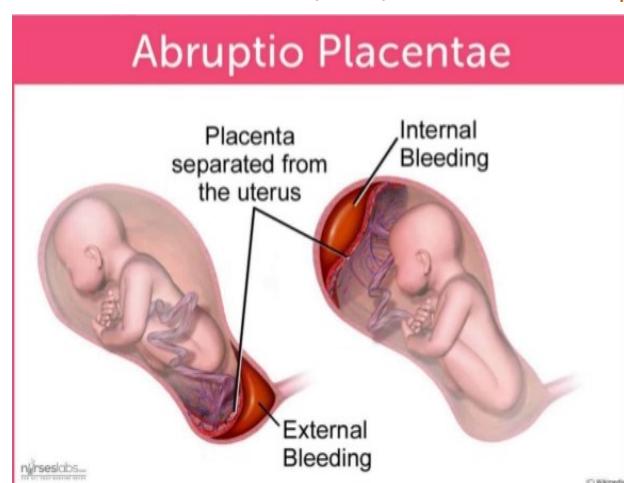
### FOR ACTIVE BLEEDING

- Loosely place trauma pads over the vagina in an effort to stop the flow of blood
- **DO NOT** pack the vagina

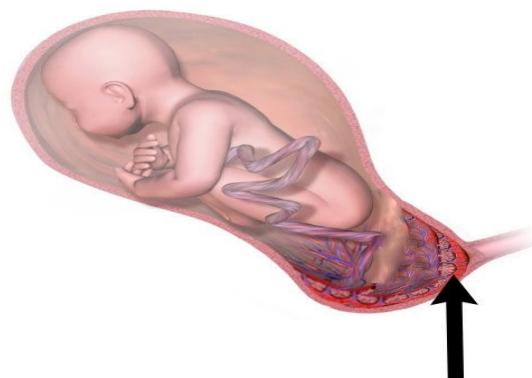
### IF HYPOTENSIVE

- NORMAL SALINE:

- 1L IV/IO, titrate to desired effect. Assess lung sounds and BP frequently.
- May repeat 1x, prn
- Precautions - Particular care must be taken in the presence of significant coronary heart disease, CHF, and renal failure patients



### Placenta Previa





# Pre-Eclampsia/Eclampsia



## INFORMATION

### SEVERE PRE-ECLAMPSIA

- A rare pregnancy complication characterized by high blood pressure that usually begins after 20 weeks of pregnancy.
- **Signs & Symptoms:**
  - HTN (SBP > 160 mm Hg **OR** a DBP of > 110 mm Hg) with any of the following:
    - AMS
    - Visual disturbances
    - Headache
    - Pulmonary edema

### ECLAMPSIA

- **Signs & Symptoms:**
  - Any of the severe pre-eclampsia signs & symptoms associated with:
    - Seizures **OR** Coma
- Either condition can occur for up to 30 days postpartum.



## ADULT

- OBTAIN A BGL

### SEVERE PRE-ECLAMPSIA (NOT IN ACTIVE LABOR)

- **MAGNESIUM SULFATE:**
  - **Dilute:** 2g of Magnesium Sulfate in a 50mL bag of **NORMAL SALINE**
    - Administer over 10 minutes IV/IO by utilizing a 15 gtt set delivering 75 gtt/min (1.25 gtt/sec)
  - **MUST** repeat 1x
  - **Contraindication - 2<sup>nd</sup> and 3<sup>rd</sup> Degree Heart Blocks**
  - **Precaution - Rapid infusion may cause hypotension**

### ECLAMPSIA

- **VERSED:**
  - 5mg IV/IO/IN/IM
  - May repeat 1x prn, in 5 minutes if seizure reoccurs or does not subside
  - **Contraindication - Hypotension**
  - **Precaution-Monitor for respiratory depression**
- **MAGNESIUM SULFATE:**
  - **Dilute:** 4g of Magnesium Sulfate in a 50mL bag of **NORMAL SALINE**
    - Administer IV/IO utilizing a 60 gtt set, run wide open
  - **Contraindication - 2<sup>nd</sup> and 3<sup>rd</sup> Degree Heart Blocks**
  - **Precaution - Rapid infusion may cause hypotension**

**OR**

### IF UNABLE TO ESTABLISH VASCULAR ACCESS

- **MAGNESIUM SULFATE:**
  - 4g IM (8 mL total)
  - 4 mL per injection site max. This will require 2 injection sites
  - **Contraindication - 2<sup>nd</sup> and 3<sup>rd</sup> Degree Heart Blocks**
  - **Precaution - Rapid infusion may cause hypotension**

# ***Meconium Staining***



## **INFORMATION**

- Meconium will appear as a yellow to dark green substance that may be noted in the amniotic fluid, coming from the vagina or covering the neonate's head.



## **NEONATE**

### **MECONIUM STAINING**

- If upon delivery of the head there is meconium staining present:
  - Use a bulb syringe to clear secretions from the mouth and then nose before delivery of the shoulders
  - Meconium aspirators are rarely needed, however consideration for usage may be given in patients whose airway is obstructed by meconium that cannot be cleared by simpler methods



# Normal Delivery



ADULT

## NORMAL DELIVERY

- **POSITIONING:**
  - Place patient on her back with knees flexed and feet flat on the floor
  - Control delivery of the head, with gentle perineal pressure
  - **DO NOT** apply manual pressure to the uterine fundus prior to the birth of the child
  - **DO NOT** pull or push on the neonate
  - **DO NOT** allow sudden hyperextension of the neonate's head
  - Once the head delivers:
    - Suction the mouth and then the nose
    - Support the neonate's head as it rotates to align with the shoulders, gently guide the neonate's head downward to deliver the anterior shoulder
    - Once the anterior shoulder delivers, gently guide the neonate's head upward to deliver the posterior shoulder and the rest of the body

## UPON DELIVERY OF THE NEONATE

- Dry, warm, and stimulate the neonate
- Keep the neonate at the same level of the placenta
- Once the umbilical cord stops pulsating (usually 3-5 minutes):
  - Clamp the cord in the following fashion:
    - Place the first clamp 4" away from the neonate's body
    - Milk the cord away from the neonate and towards the mother (this will minimize splatter)
    - Place the second clamp 2" away from the first, towards the mother
    - Cut the cord between the 2 clamps
- Place the neonate on the mother's chest, skin-to-skin, and cover with a dry blanket
- Record and encode an APGAR score at 1 and 5 minutes and document the delivery time
- Apply firm continuous pressure, manually massaging the uterine fundus after the placenta delivers
- Preserve the placenta in the bag provided with the OB Kit or a "Red Bio-Hazard bag" for inspection by the receiving hospital

## APGAR SCORE

*Perform at 1 and 5 minutes after birth*

CRITERIA	SCORES		
	0	1	2
<b>Activity</b> (muscle tone)	No movement	Some movement	Active movement
<b>Pulse</b>	No Pulse	Less than 100 bpm	Greater than 100 bpm
<b>Grimace</b> (reflex, irritability)	No response to stimulation	Grimace or feeble cry w/stimulation	Active motion w/stimulation
<b>Appearance</b> (skin color)	Blue all over	Body pink, extremities blue	Completely pink
<b>Respiration</b>	No Breathing	Slow, irregular breathing	Strong Cry

### APGAR SCORE INTERPRETATION:

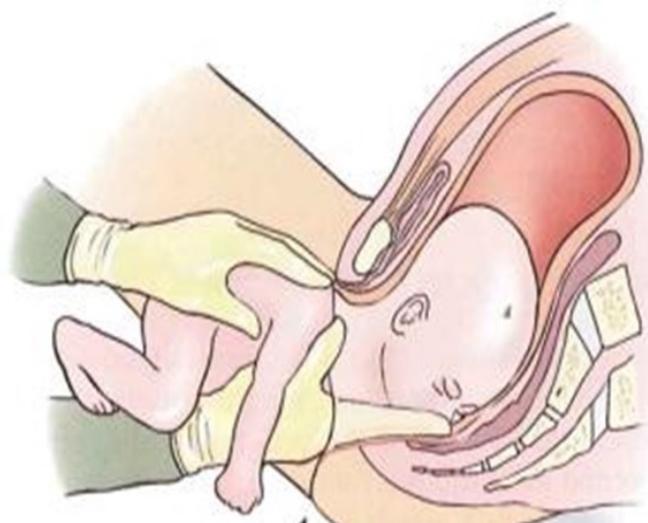
0-3	<b>Severely Depressed:</b> Major Resuscitation Needed
4-6	<b>Moderately Depressed:</b> Moderate Resuscitation Needed
7-10	<b>Excellent Condition:</b> Minimal/No Resuscitation Needed

# ***Delivery Complications***



## **BREECH BIRTH (FEET OR BUTTOCKS PRESENTATION)**

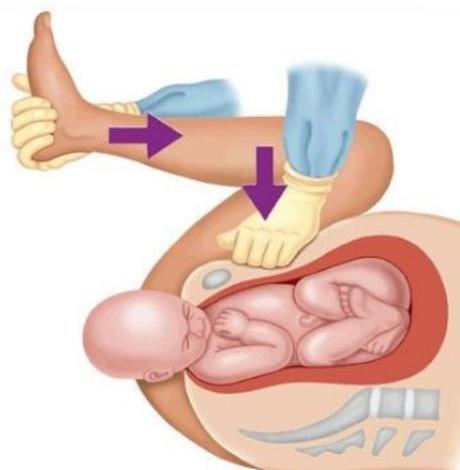
- If the head does not deliver within **3 minutes** of the body:
  - Elevate the mother's hips (knee to chest position)
  - Insert a gloved hand into the vagina
  - Push the vaginal wall away from the neonate's nose and mouth
- Expedite transport while maintaining the knee to chest position and the neonate's airway
- **OXYGEN**
  - Administer blow-by **OXYGEN** to the neonate



## **SHOULDER DYSTOCIA (DIFFICULTY IN DELIVERING THE SHOULDERS)**

### **MCROBERT'S PROCEDURE:**

- Hyperflex the mother's legs tightly to her abdomen
- It may be necessary to apply suprapubic pressure (mother's lower abdomen)
- Gently pull on the neonate's head



# ***Delivery Complications*** *Continued...*



## **NUCHAL CORD**

- Check for the presence of a nuchal cord after delivery of the head
- If the cord is around the neck:
  - Gently hook your finger under the loop
  - Pull it over the neonate's head
  - You may have to repeat this if there is more than 1 loop present
- If you are unable to free the cord:
  - Clamp the cord in 2 places
    - Cut the cord between the clamps



## **PROLAPSED UMBILICAL CORD**

### **POSITIONING:**

- Place mother in the knee to chest position
- Manually displace the uterus to the left
- Insert a gloved hand into the vagina
  - Push the neonate up and away from the umbilical cord regardless if there is a pulse present or not
  - Maintain this position during transport
- Frequently reassess the umbilical cord for the presence of a pulse, as contractions are likely to compress the umbilical cord
- Wrap the exposed cord in a moist sterile dressing
- Expedite transport to closest OB facility



Manual displacement of the uterus